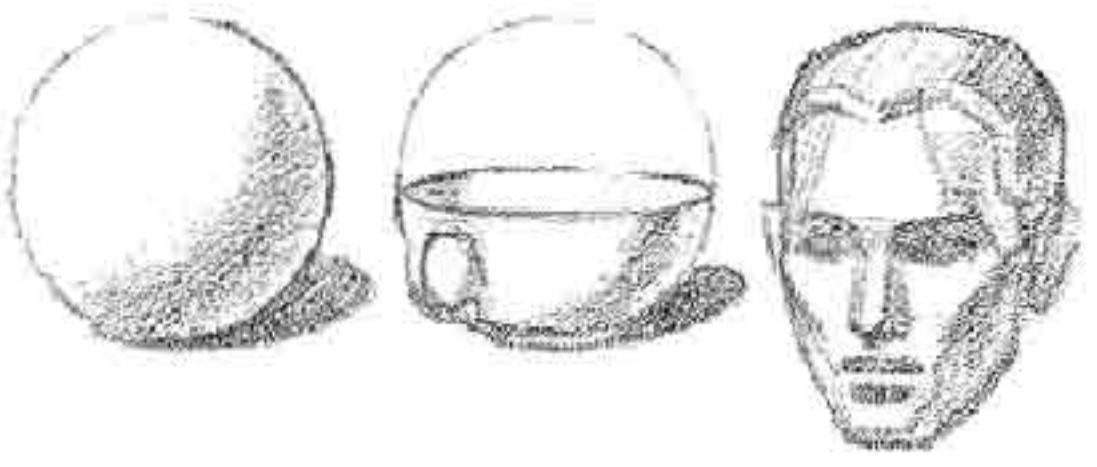
ALL DRAWING STEMS FROM ONE OR MORE OF THESE FORMS



ROUND

SQUARE

CYLINDRICAL

CONICAL

PYRAMIDAL

The Fundamentals

Art is really having its chance. The urge to draw seems to have taken hold of many more thousands today than ever before. It has spread across the nation. While many are interested in art as a pastime or hobby, others would gladly choose it as a means of livelihood if they were convinced that their ability was sufficient to provide any real hope of success.

There will always be a certain amount of confusion about what is talent or native ability in drawing and what is knowledge of the craft. Too often, knowledge is construed as talent. On the other hand, drawing that lacks constructive knowledge is seldom successful as drawing. The truth is that we do not see the talent until the means of bringing it forth has been developed. That means is a reasonably accurate analysis and understanding of the laws of nature as they apply to man's vision.

Drawing is vision on paper. More than that, it is individual vision, tied up with individual perception, interest, observation, character, philosophy, and a host of other qualities all coming from one source. It cannot, and to be successful should not, be anything else. Drawing is very closely related to the other creative arts, all of which are outcroppings of a desire to express individual emotion, to make the other fellow conscious of our inner feelings. We want him to listen or look, and we want his appreciation of what we have to offer. Perhaps we wish to receive admiration for our particular accomplishments. Perhaps we have a message we deem worthy of others' attention. Perhaps we see in such an effort an enjoyable means of making ourselves useful, or providing ourselves with the livelihood that we must achieve in some way.

We who choose art as our medium of expression should realize that it has certain fundamentals from which we progress, just as there are fundamentals of literature, drama, or music. Unfortunately, the fundamentals of an approach to art have not usually been so clearly defined for practical study as have those of some other creative activities. Commercial art is a comparatively new profession. However, the leaders in the field are beginning to contribute time and thought to its teaching.

Success in the creative fields is always accompanied by distinctiveness, something that singles one out as an individual and sets him apart from the crowd. One artist can be as successful as another in his use of basic knowledge, without repeating another artist's performance. If there is any way that one man in the craft can really help another, it is by increasing his knowledge of the craft itself, not in the particular qualities of the man's own work. The knowledge of our craft must be pooled, as it is in the sciences and other professions, each of us absorbing and in turn contributing. It is difficult for a man to teach without presenting his own work as an example. But I am certain that in this book, for example, there is much material which the student can apply to his own work without reference to any particular style or technique of mine.

Suppose we have two drawings before us. One appeals; the other does not. This one is good, the other bad. Why? I believe I can point out underlying reasons that are perfectly understandable. Strangely enough, the reasons are usually not found in art books or taught in classes. The response to drawing is related to the emotions and experience of the individual, and is wholely apart, so far as I know, from the teaching of art. Yet I do not believe art can go very far unless the artist has some sort of an understanding of this response. An artist can go all his life without realizing why his work does not appeal. Even successful artists may not really know why their work does appeal, though they thank heaven it does.

To understand why a drawing does or does not appeal, we must recognize a certain ability that is developed in every normal individual from early childhood through adult life. The term "intelligent perception" I think comes as close as any to describing this faculty. It is vision coordinated with the brain. It is a sense of rightness developed by contact. At some time or other, our brains accept certain effects or appearances as truth, and abide by these decisions. We learn to distinguish one appearance from another, in size or proportion, in color, and in texture. All the senses combine to give us intelligent perception. We have a sense of space or depth, even if we know nothing of the science of perspective. We are quickly aware of distortion or deformity, since the appearance does not coincide with what experience has taught us is normal or truthful. Form is registered in the mind, even if we know nothing of anatomy and proportion, so that we recognize a face immediately, though we could not even give a good verbal description of it. Our sense of proportion tells us that this is a child and that a midget, or this a puppy and that a small dog. Intelligent perception includes a feeling for bulk and contour. We know a swan from a goose, or a goose from a duck. This trait is as well developed in those who look at art as it is in artists. We all as individuals have subconsciously accepted certain effects of light. We know when appearances are consistent with daylight, artificial light, twilight, or bright sunlight. Such perception is part of nature.

The minute the spectator sees change of proportion, distortion, change of form, color, or texture, he realizes that something is wrong. The cleverest imitation will not fool him. The dummy in the department store window is a dummy to everyone. We know flesh from wax by the effects that have previously been registered in our minds.

We artists cannot ignore this intelligent perception and expect to secure intelligent response, or even favorable response, to our work. Make up your mind that your audience will react to your work just as it does to life itself. Intelligent perception finds only truth convincing. *The layman does not need to know anything of art to know whether he likes your work or not.* We can use all the arguments, alibis, and defenses in the world; we can explain ourselves hoarse; but we cannot affect something so deeply imbedded in human consciousness. If what we say in paint is untrue, in color values or effect, the spectator feels it, and there is nothing we can do to convince him otherwise.

Psychological response goes still further. Every picture should have some reason for existence, some purpose behind it. If we can make the spectator feel that purpose we have succeeded further in capturing his interest. Not only is every man living among nature's effects, he is also living experiences. Life is not only what he sees but what he feels. Supplementing in our drawing an emotion that is already within him secures further response. You can feel emotion only within yourself, and any emotion that is in your work must come from you. You can be sure that most of the emotions you feel are also present in others. That is why we live through a movie or a play with the characters. To a considerable degree, we like or dislike a performance insofar as it has appealed to our individual emotions. For the same reason we like or dislike a piece of art.

When drawing is convincing to the intelligent perception of the spectator because of its rightness of form, texture, space, and lighting, and at the same time appeals to his emotions, the artist can depend upon a favorable response.

Drawing should not be taught by teaching specialized or individual techniques. What should be taught is the way to get the form, the contours, and the values, regardless of mannerisms. How Jim Jones handles a pencil has little to do with your main problem. How he handles light on form and contours is what to look for, in case he interests you. However, if Jim Jones is good, you can be quite certain he goes for his information to the one best source — life itself. He has

probably employed a model or used a camera to secure intelligent information. He keeps faking to a minimum, using his imagination only when he has no other way of getting a result.

There are certain basic elements of good drawing without which no drawing can really be successful. I believe these elements can be taught. So far, I have been unable to find a textbook of drawing which defines the relationship of proportion and perspective to the study of light and shadow. Since these elements are so thoroughly interdependent, this book, which presents them that way, should meet a real need.

For those who have an understanding of nature's laws, plus vision, the greatest teacher is nature itself. If the artist has the technique of depicting the construction and contours of an object set in space, plus the knowledge of how light operates on the forms we consider basic, he has acquired the springboard to his own individual expression, which, after all, is of greater value than anything else.

Suppose we ask ourselves what a good drawing is? Let us think first of the qualities that make up a good drawing; these point out the departments of our craft. Anything we draw is dimensional. It has height, breadth, and thickness. There is a ratio between the three dimensions, which we call proportion. Then all the parts within the subject have ratios to one another, and if these are correct they add up to make the over-all dimensions correct. A drawing cannot be good if it is not in proportion, so let us call *proportion* the number one element.

Since the proportions exist in the thing we wish to draw even before we have drawn it, let us consider how we shall place it within the boundaries of our paper surface. Let us think of the paper as representing open space, within which we wish to place the subject. We want it to settle nicely within the area in which it is most pleasing and at the same time most convincing. We look carefully at the subject to select a viewpoint. We may cut a finder — a rectangular opening in a card that is in proportion to our drawing area — to see just where the subject should go. How big or small should it be, how close or far away, and where? Let us call this element *placement*.

When a viewpoint has been selected and a placement decided upon, we start to draw. The third element pops up. We cannot draw an object without *perspective*. Since perspective is the first main problem that arises, it is the first thing the artist should learn. An understanding of it should precede or be a part of every art-school training. No drawing is real drawing unless it is related to an eye level or horizon, with the relationship understood by the artist. The subject of perspective cannot be covered completely in this book, but I shall attempt to give the stock-in-trade knowledge of it that I believe is indispensable. I suggest, however, that you get other books, and, while you are learning, learn as much about it as possible, since it is one of the most important elements of successful drawing.

Suppose we understand the perspective and get it correct. What now? In order to set up convincing form in the effect of light, halftone, and shadow, we must separate the three into *planes*. Through the effect of light on planes we arrive at the solid appearance of the form. We look first for areas or planes of full light, then, as the form turns away from the light, we find the halftone areas or planes. Beyond the halftone planes we find the areas that are in shadow, the shadow planes. Within the shadow we find reflected light, which, though a part of the shadow, still defines form.

After defining the planes, we come to another element of good drawing, which we may call *pattern*. When we deal with values, we become involved in the tonal arrangement of a drawing. Pattern is another aspect of composition. Placement relates to composition in terms of line; pattern relates to it in terms of tonal areas.

Here is where creativeness gets its first chance. We can arrange the patterns of a subject, not simply accept all patterns as the camera does. Nature's patterns may be good or bad in our

opinion and within our particular space limits. Every drawing is an artist's problem in spacing and arrangement of the patterns of tone.

Composition is an abstract element. Only a little of composition can be taught. There are books on the subject worthy of hard study. Add some to your library. However, composition seems to be more or less instinctive. Most of us would rather make our own arrangements than be told how to make them.

The best way to arrive at pattern or composition is to make small sketches, which we call thumbnail sketches. Make them up of three or four tones, until you get the feel of the subject. These may well precede any actual drawing. Drawing is essentially design, and design is drawing. One will always be the outgrowth of the other.

Now, if you have not already noticed it, we have listed five elements of good drawing, all starting with the letter P. These are: proportion, placement, perspective, planes, and pattern. Let us call them the five P's.

But these are not the only considerations of good drawing. A while back we were considering the emotional qualities which every good drawing should have. If the subject is inanimate, the emotional qualities will lie in the way it is presented. If it is a landscape, it may be the mood of the day, or the freshness and charm of handling. In a still life it may be the appeal of the subject matter, the beauty of the objects themselves. In a figure subject, the emotion may be revealed in the action or expression of the figures, or in the story they tell.

Before beginning to draw, close your eyes and try to see the subject. Think of what would be happening. Think of the basic idea or purpose of the effort. All this may be called the *conception* of the subject. Again we need to make thumbnail sketches, even scribbles, until our subject begins to take shape.

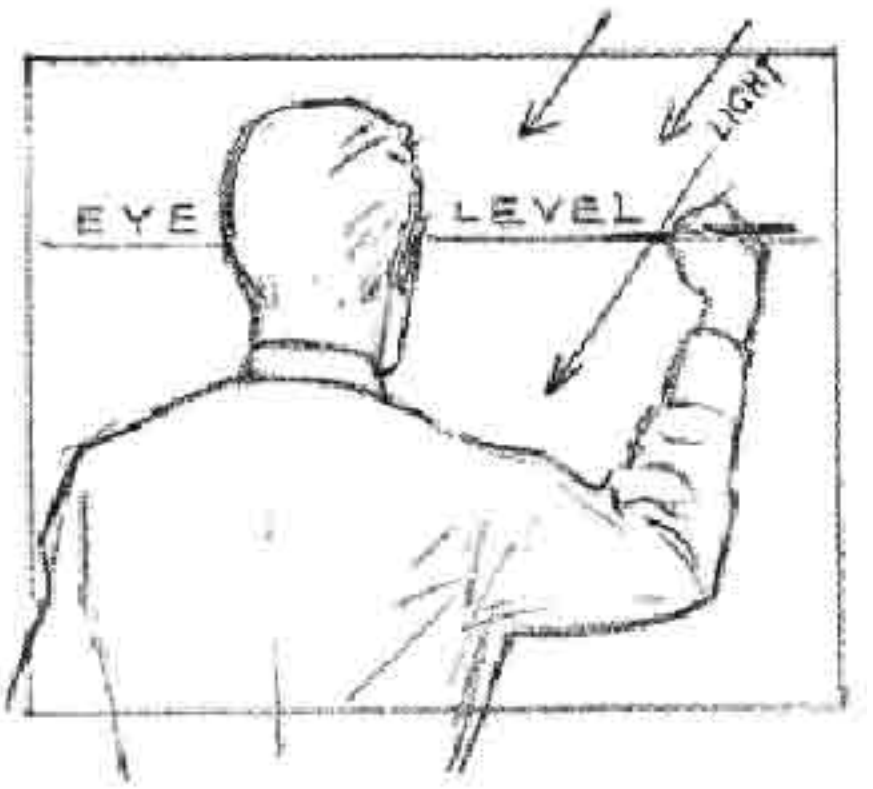
Remembering that sense of rightness which we may expect in those who will look at or judge our efforts, we now need information in order to do the thing convincingly. We have an idea, we have made sketches, and we must now proceed with our drawing. The next important element is *construction*. Now we must collect photographs, make sketches and studies, hunt up clippings, go to any available source for correct information. If we can afford it, we get a model for photographs or studies.

There is another element so closely related to construction that it must be considered at the same time, since we cannot achieve the one without the other. This is *contour*. Construction is concerned with the bulk or the mass from the inside out. Contour is the outer edge of the mass in space. Construction is based on viewpoint and perspective. The appearance of an object may be different from every angle. Therefore we must establish an eye level to which we relate all construction and contour. No subject can be drawn correctly to more than one eye level. This is because it is impossible to look at any object from two positions at the same time. For this reason, the information we have must be adjusted to fit the problem. Two clippings or two photographs of the same subject will seldom have the same eye level, or — and this is vitally important — the same source or kind of light. The ideal information, of course, is secured by having all parts of the subject before you at once, in the same lighting, from one viewpoint of eye or camera. Beginners especially should work this way. That is why still life, art-school poses, and outdoor scenes are the best subjects from which to learn to see and to draw. But we still need the fundamental information on how to draw them. The student who goes to an art class knowing something of proportion and perspective and how to achieve them will pass his fellow students by leaps and bounds, and when he leaves school his work will gain acceptance much faster than theirs will.

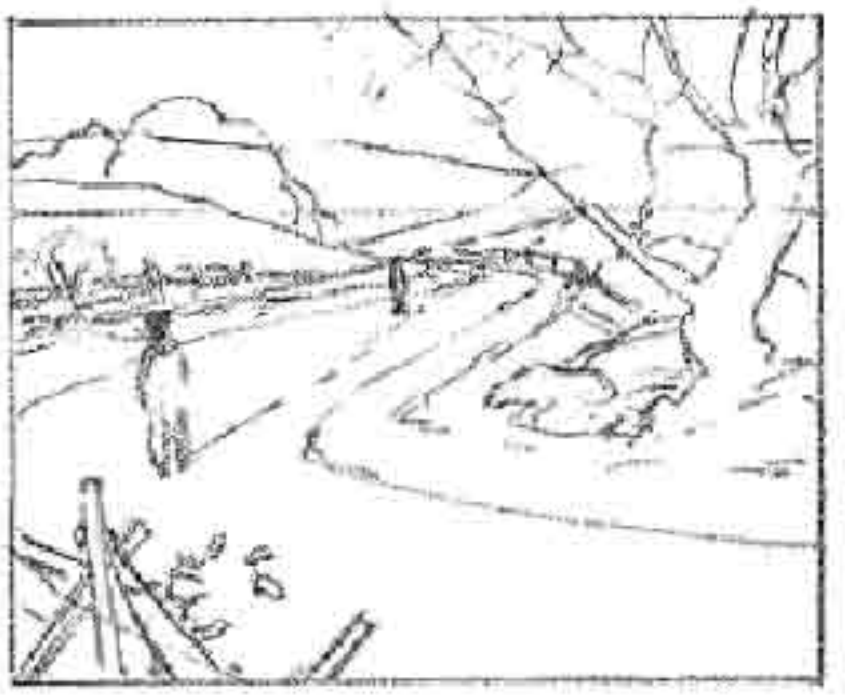
Without a knowledge of perspective and the lighting of the basic forms, or some idea of measuring and proportion, the artist becomes a slave to photostats, projectors, or any other

Think of your paper as representing open space, not as a two-dimensional surface, but as if its edges were the boundaries of an open window. You look at all of life and nature through this paper window.

Attempt either to set forms into this space that exists before you or to give a feeling of actuality to forms which you create from a knowledge of the laws of nature. We study nature for effects and set them down.

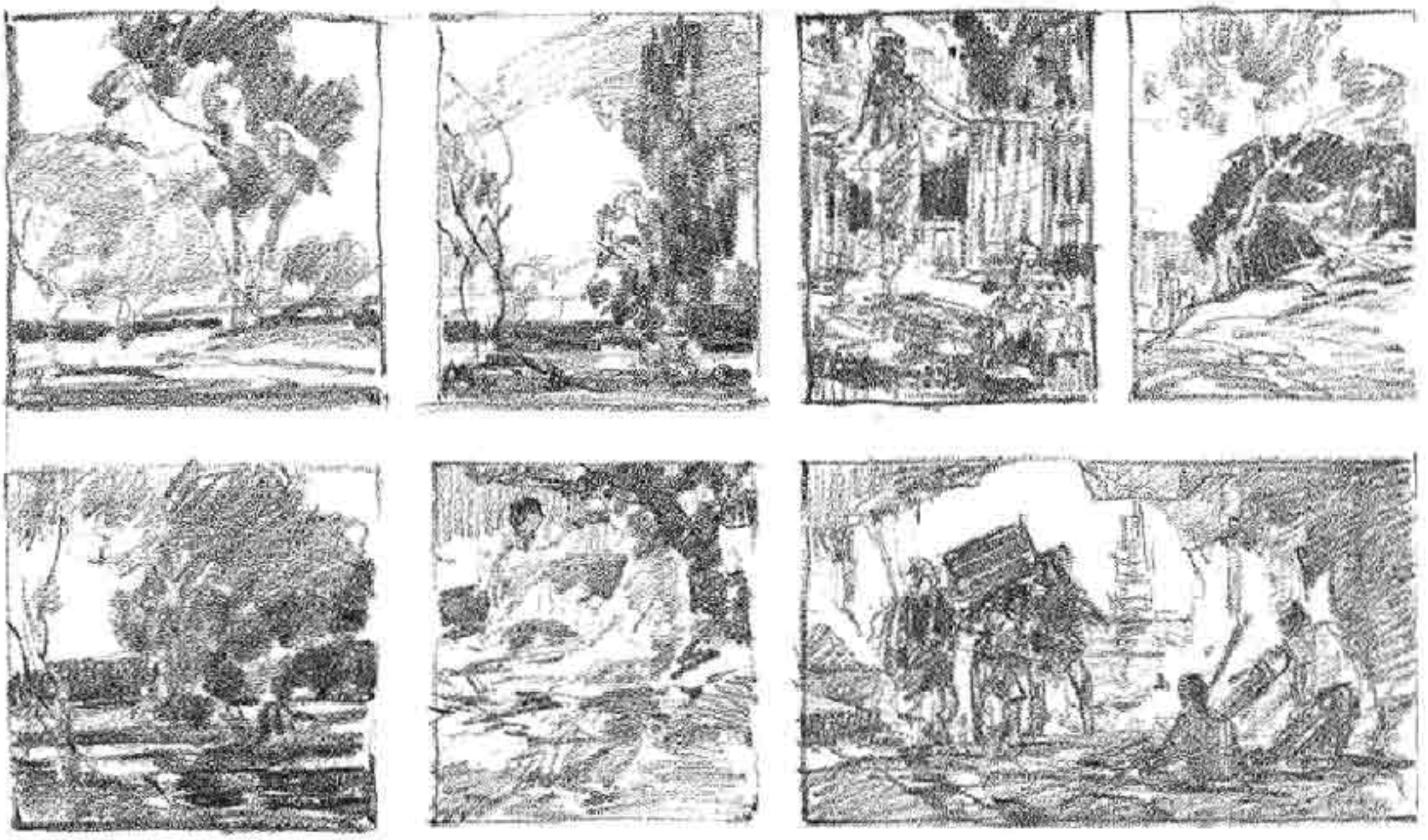


This involves dimension, contour, viewpoint (meaning perspective), and lighting. Only through light, which produces all tone, color, and appearance, can we produce a true image of life.



Really to draw, we cannot think only of any single aspect of drawing, such as contour, without the other essentials, but must seek to unify all aspects into a complete and organized whole.

THUMBNAIL ROUGHS



The habit of setting down your mental conception of a subject in miniature roughs can play a most important part in your development as an artist. The best way is to shut your eyes and try to visualize what is taking place, as it would be in life. You have no detail to go by, so just suggest the material. Think of some kind of light. It will come.

mechanical means that will substitute for the knowledge he lacks. If he traces or projects photographs instead of drawing his subject, the result will show up in his work. Such an artist will seldom reach the front rank, unless his work has other qualities that somehow make it better than the work of other photograph copyists. If a drawing is to be individual and dynamic, the artist must use the camera only to provide something to draw from, as he would draw from a model. The camera does not see in the same perspective or proportion as do the two human eyes. Being a slave to the camera usually leaves the stamp of the photographic on a man's work. If you use photographs, square them off and draw, but always draw, don't trace.

I once knew of an artist who was asked to do a subject away from home, when all his copying paraphernalia was back in his studio. For once he was forced to draw. He went through torture before he had finished. The drawing never was good. He had never realized how much he depended upon his crutches. He went back home and started drawing in earnest. The slave to the camera never really knows how bad he really is or what his work lacks, until he can see the difference of real drawing on his own drawing board. The way he works is a man's own business, but it should be pounded into the novice that his greatest hope lies in his own good freehand drawing.

When, by dint of hard effort, we succed in getting construction and contour, there is something else, closely related to both, which we must be constantly thinking of. That is *character*. Character is the thing that distinguishes one object or person from any other. Usage brings character to an object; experience brings it to man. Character is alway a singularity. Pictorially, character is a form that belongs to this subject and no other. It is form in a particular place, under particular lighting conditions, from a particular viewpoint, with particular effect. It is something immediate, caught as if at a glance — the set of the features at that moment, the look of the eyes, the mouth, the planes of the face in that lighting, all having to do with circumstances then and there. Here is where the camera can catch valuable information. But before the camera clicks, the emotion and appearances all must be present—felt within the artist and transposed to the model, or existing in the model and recognized and caught by the artist. Then, through the whole effort, the artist feels the thing he wants to express, the thing that makes him want to say something with his pencil or brush. Such feeling has a way of getting into the technical expression, the handling of the medium. Sometimes the artist is not even conscious of it, but it still contributes to the success of the work, simply because the feeling is also conveyed to the spectator.

The study of clothing and drapery does much to add character, the hands, the shoes. The gesture, in correct spacing and drawing, does its part. And yet gesture is really construction and contour, planes and values. A portrait sketch is about one hundred per cent character, which means accurate spacing of features, planes, and contour. Character cannot be achieved without all the elements of good drawing. *Real presentation of character lifts the artist to the top of his profession.*

Finally we have the most important element of all, which is *consistency*. Consistency embraces much. Consistency is really truth, as recognized by that intelligent perception we all have, artist and layman alike. Consistency, technically, means that lighting, proportion, perspective are so handled that all elements belong to one particular subject and no other. There is a consistency of purpose, when all things press home that purpose. There is a technical consistency of treatment, so that all parts of the subject seem to be done by the same hand, in the same individual way. I do not mean that all surfaces should be handled as if made of the same material, or with the same kind of strokes, but that all parts have a unity of approach and vision which organizes the subject into a single

1

PROPORTION
The three dimensions

2

PLACEMENT
A position in space

3

PERSPECTIVE
Relationship of viewpoint to subject

4

PLANES
Surface appearance as defined by light and shadow

5

PATTERN
The deliberate arrangement of the tones of the subject

THE FIVE C'S

CONCEPTION
A rough indication of an idea

1

CONSTRUCTION
An attempt to establish the forms from life or from basic knowledge

2

CONTOUR
The limits of forms in space, according to viewpoint

3

CHARACTER
The specific qualities of individual units of your subject in light

4

CONSISTENCY
All the essentials of construction, lighting, and pattern, organized as a unit

5

expression. Let us see the artist himself coming through his work — his feeling about it, his joy in doing it. If this is achieved, the work will never be considered imitation, for it is not an imitation. When we think of consistency, then, let us think of the unity of all the elements brought together into one whole effort. The artist won't go wrong when he can see the big truths, or what he feels to be the big truths. If he looks for the big planes, the big lights and shadows, the big values and relationships, he will do a better job. One can easily get lost in a lot of little truths without seeing the big ones. The leaf compared to the bulk and mass of the tree itself is the difference between big truths and little ones, or between big vision and eyesight.

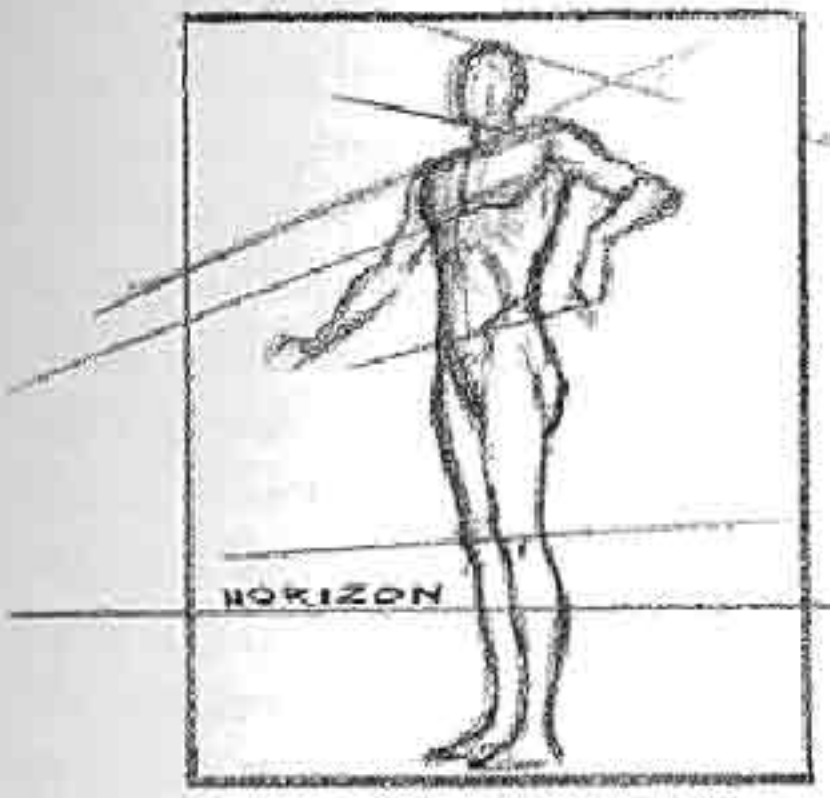
Now let us take stock of all these elements. You may have realized that we have now added five more, all beginning with C this time. They are conception, construction, contour, character, and consistency. So we have five P's and five C's — which should help you remember them. They are illustrated on pages 18 and 19.

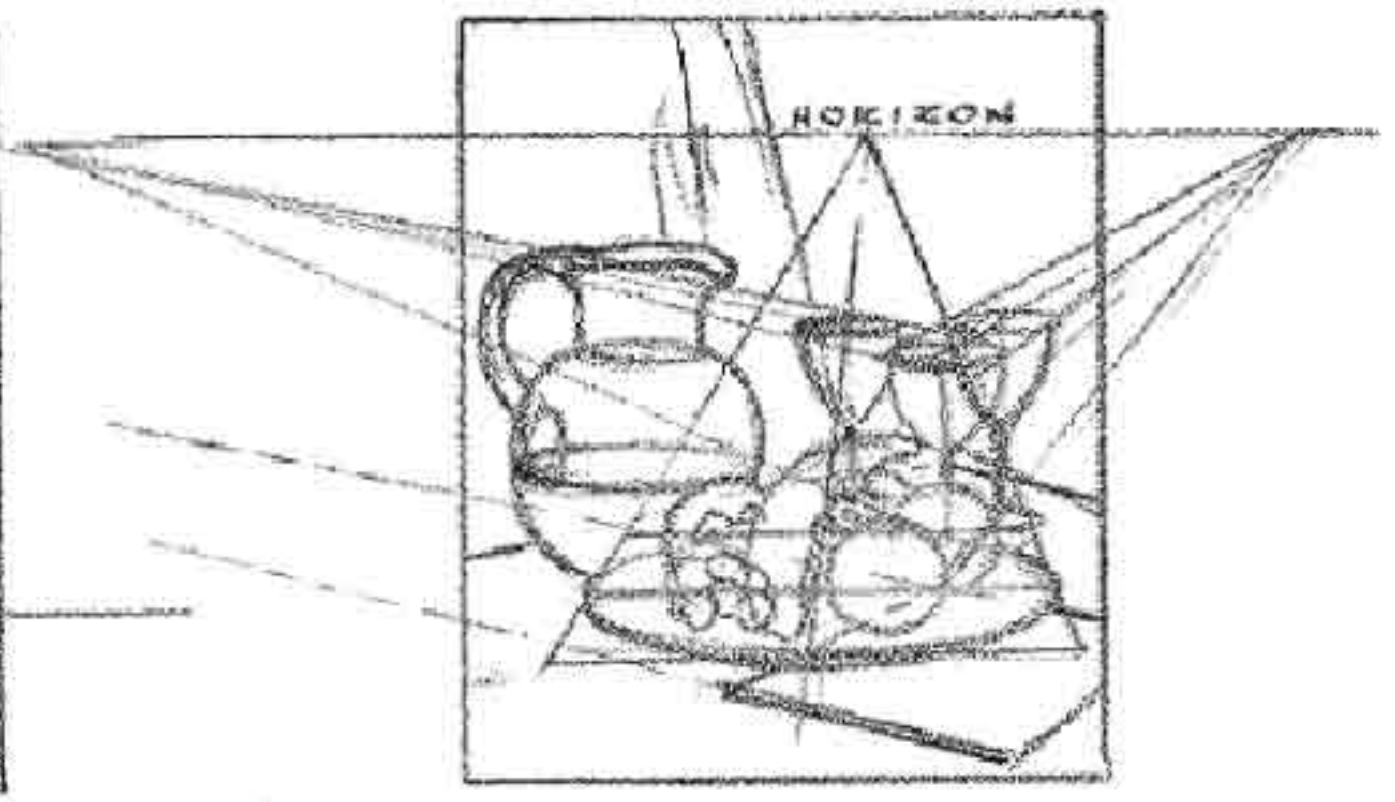
Repeat the names of these elements over and over in your mind until you memorize them, for they will always be the guiding lights to successful drawing. We will not succeed with them all every time, nor will every single drawing be successful, but we can look at each drawing to see in how many of these elements the work qualifies. A drawing fails because of failure in one or more of the elements; analyzing it to find the source of failure points to our errors and difficulties. Concentrating on these elements keeps us on our toes, and little by little our work improves. In our intelligent perception we have a guide to visual right and wrong as good as our sense of moral right or wrong — perhaps better. We can be taken in much more easily through our ears than through our eyes. Have the courage to believe in what you see, as you see it, and to draw it that way, even if Jim Jones sees things another way. That is what makes each of you an artist. Art is certainly a matter of equal rights; nobody has a corner on it.

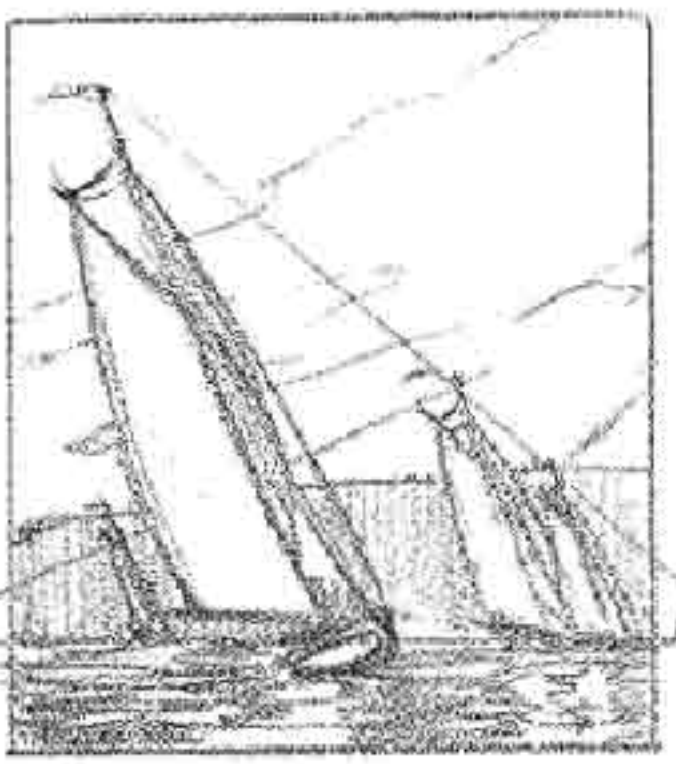
In organizing the material in the book, I have placed perspective first, because I believe it is easier to learn to handle line alone before getting into the complications of planes and tones, which are meaningless without dimension and perspective. In art schools, a subject is usually set up before us, and we simply have to draw what is there. But when we are out on our own, the subject is usually not there. It is not too hard to draw a cube that is set up before us. But what we must learn is to draw an imaginary cube at any eye level, to fit into any set of circumstances. The importance of this will be understood when you know that almost any object may be drawn in perspective from a cube or block, since that represents the over-all three dimensions of anything we draw. Even a sphere fits compactly into the cube. The cube or block may be thought of as the box that will fit around anything in the universe. Knowing the proper way to draw the block leads us right in at the front door of perspective. The building is the outside of the box. The interior is the inside, and we must know how to give it dimension and measurement, when those are needed. They usually are needed, if only to keep the figures on the floor, in proportion to the walls, doors, and furnishings. When buildings and figures occur in the same subject, we need dimension and scale.

It is simple to place a figure at any given spot on the floor or ground plane, in correct proportion to other figures, but over and over even high-ranking artists fail to achieve this, and the result is a bad job, as even John Doe can see. When different eye levels appear in a drawing, the artist has probably failed to reconcile the inconsistencies in the various pieces of copy from which he is working. He may not even be aware of the inconsistency, but the people who see his work will have an uneasy feeling that something is wrong, though they do not know what. When all is right the public really clucks over a thing. When it is wrong they are usually just silent.

EVERY DRAWING HAS A HORIZON







Anything we draw, no matter what it is, is affected by the eye level and viewpoint from which we draw it. The eye level is the horizon of the picture. It may be above or below the picture plane or may cross it at any point. We must know how to relate all forms and their contours to an eye level. In a photograph, everything is related to the camera lens in the same way, but the artist cannot depend upon the camera. He must know perspective.

The successful artist must keep them clucking.

I personally believe an artist can develop a sound individuality in his work only if he knows how perspective, light, and shadow truly affect the basic forms. Then it is not too difficult to perceive the relationship of all other forms to the basic ones. The artist must know the difference in the quality of diffused light and direct light and not mix the two within the same subject. So many artists get involved in tricky techniques, which are well and good if all else is in order but can cover up just so many sins and no more. Technique alone will not satisfy that intelligent perception of John Doe's, and if we want him to write to the magazines and say that he thinks our work is good, we can't depend on technique. Form is form, and in any particular lighting every plane in a picture must have its relative value, or the whole fails to convince. The wrong value means that the angle of the plane is not what it should be, and therefore the form is incorrect whether the contours are right or not.

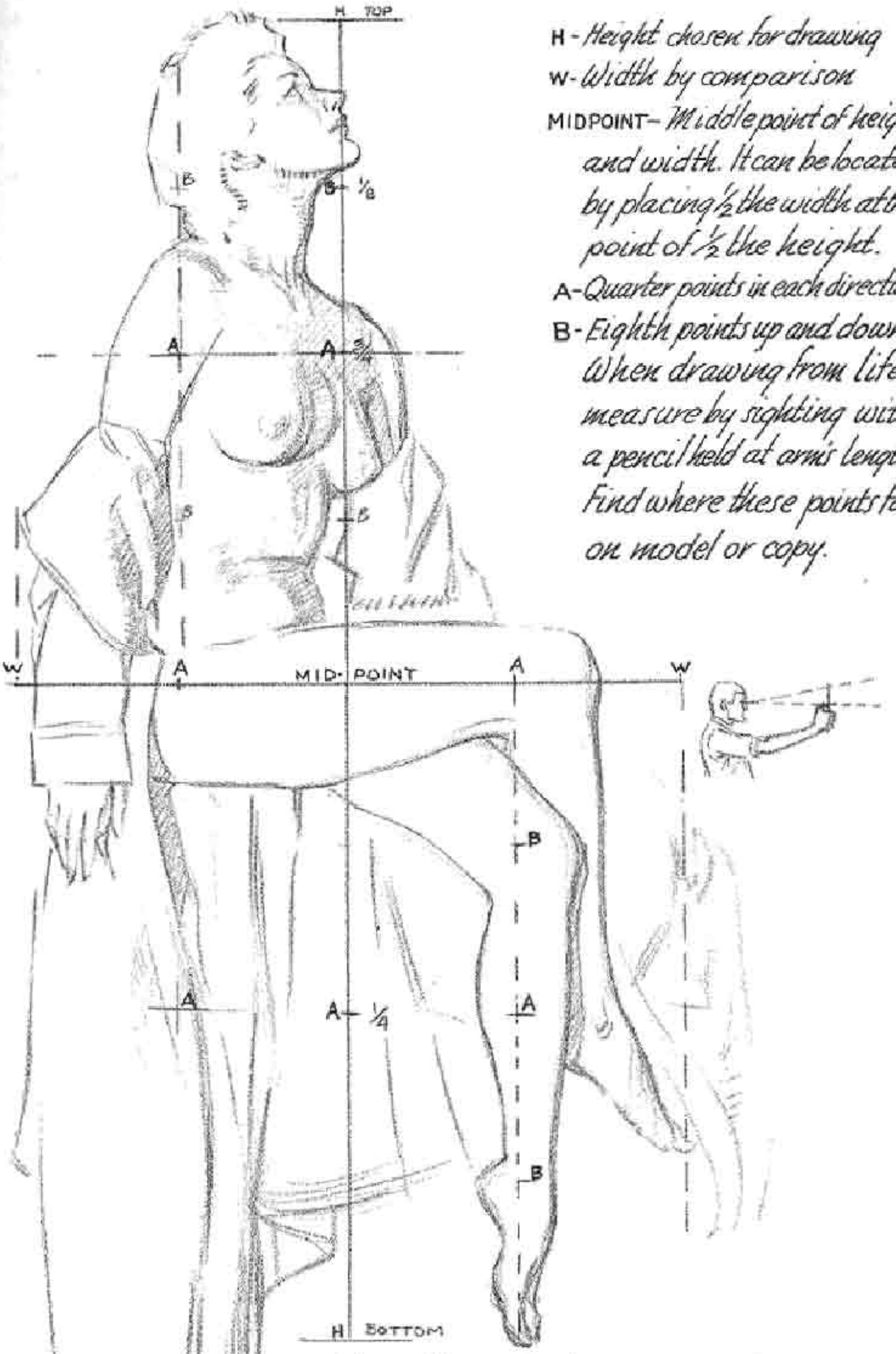
Let us consider for a moment what made the great artists great. In almost every case they were masters of form, which means that they had to be masters of light on form. Light and form were no different then. The artist of the past had no clippings or cameras. They had to find out from life. By observation and study they learned truths which are still staring us in the face, but which we do not know or see, because we think an F.2 lens is going to take the whole heavy business off our shoulders. We actually have twenty times the opportunity to produce masterpieces that they had. We are not bothered with making materials, or sketches, or studies from life. The truth is we are just not bothered. We are neither craftsmen nor contributors. The only legitimate excuse the artist of today has — and it's worn thin — is lack of time. But where is lack of time taking us?

To know is the surest way in the world to save time. An error in perspective can use up more time than any artist has. Bad planes and incorrect modeling can ruin a man's chances so fast that the time saved may be spent pounding sidewalks. When a painting or drawing stands as a great thing down through the years, with generation after generation of new spectators, I believe there is a positive reason, which means more than the name signed on the canvas. Those artists were great because they came so close to the truth of vision, because they had great understanding of nature and her ways. To stand before a Franz Hals is an experience. It is life, brought down through the years to you. The woman in the white cap and frilled collar is a living character, and we see her before us just as Hals saw her. She almost speaks. Through his vision and mastery we are living in a time before we were born. There is nothing we do not comprehend. No explanations are needed. We need know nothing of art to feel and appreciate the greatness of the work. I cannot believe that Franz Hals will ever be outmoded. His works will be masterpieces as long as there are people to see them and the paint and canvas hold together.

No man can successfully draw or paint a head until he can render the surface of a sphere in light. If he cannot feel the relationship of the rounded forms of the head to the sphere or egg, the rendering will not have solidity. In the material in this book we apply the light on basic forms to the figure and the head. For a little fun, we even give solidity to comic drawings. It is possible to make even a comic seem to exist in light and shadow, with nothing but imagination to work from.

The time that you spend practicing on essentials will not be wasted. Suppose you were asked to draw a series of columns, spaced 10 feet apart, set on cubes measuring 5 feet each way, with some figures standing at the second and fifth columns, and the bases of eight columns going back in the distance. This is very simple if you know perspective. Which would take the most time, to hunt up such a building, take photographs, develop films, make prints, and set the

EVERY DRAWING IS A PROBLEM OF DIMENSIONS



H - *Height chosen for drawing*

W - *Width by comparison*

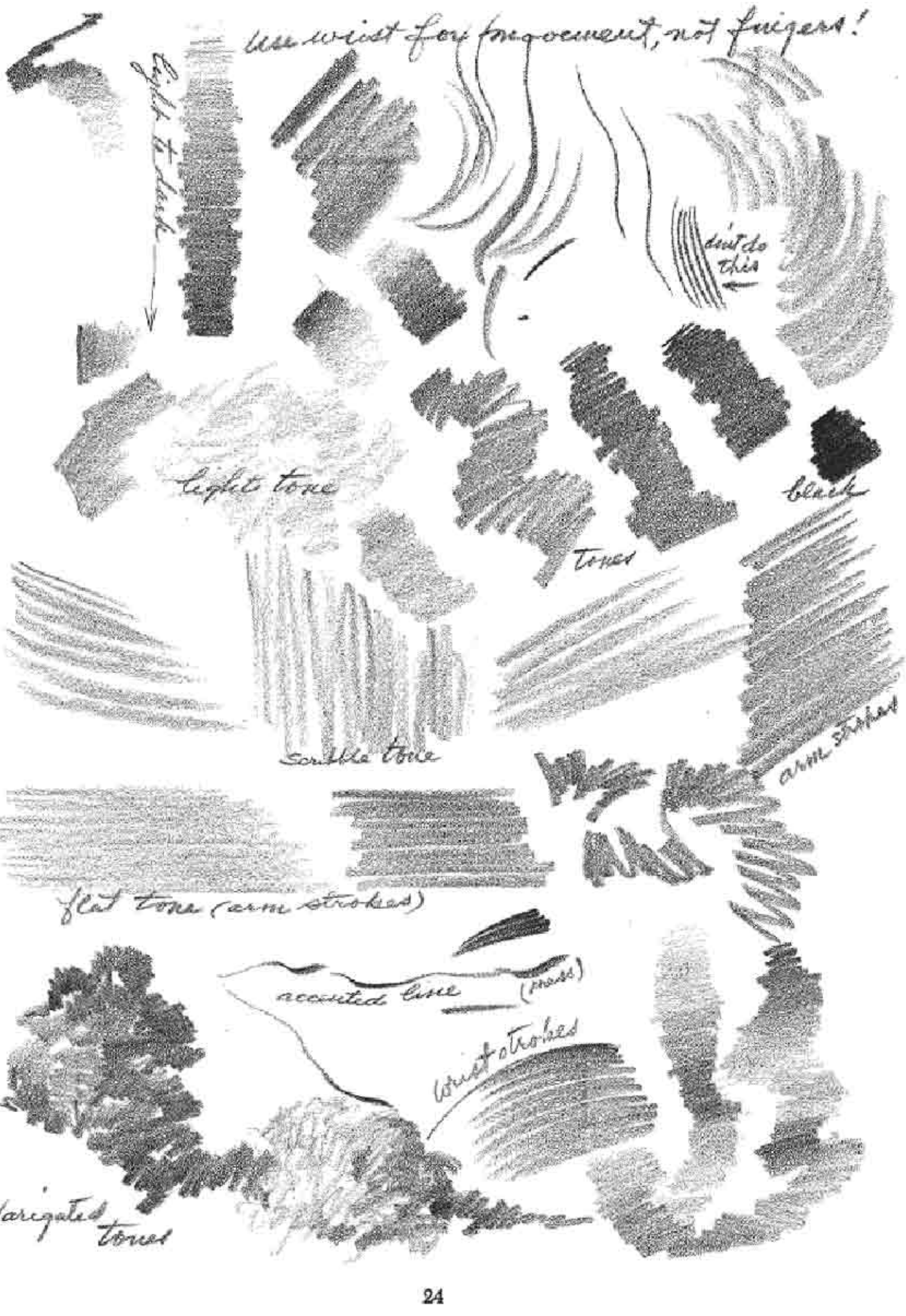
MIDPOINT - *Middle point of height and width. It can be located by placing ½ the width at the point of ½ the height.*

A - *Quarter points in each direction*

B - *Eighth points up and down. When drawing from life, measure by sighting with a pencil held at arm's length. Find where these points fall on model or copy.*

When all points check on your drawing, you know the proportions are correct.

SIDE-OF-THE-LEAD STROKES



assembly on a projector, or just to sit down and draw it? Almost daily, lack of knowledge of simple perspective can hack away at an artist's time. The amount of motion and time which you save by knowing how to solve your problems far exceeds any saving by the projector. The more you lean on your crutches, the more your strength ebbs, and soon you cannot get along without them. No artist can ever save time by not being able to do for himself the things his camera does for him. Never let that camera get beyond being a source of information. No lens in the world is a real draftsman; that skill belongs to the artist himself.

Line drawing and painting actually simplify and stress the basic relationship of the forms. The leg or torso is actually better as a cylindrical shape, with just enough anatomy to make it convincing, than as a photographic replica of every bump and bump of the muscles on it. We must learn to subordinate much of what the lens sees. We are really concerned more with light and shadow and bulk or mass than with what the camera can give us. Photographs with several light sources, which is the way most commercial photographs are made, defy every principle of good drawing. There is no authentic form in them; it has been broken up in meaningless light and shadow; and good drawing is essentially a statement of form.

I should like the young artist, as he starts working on the material in this book, to consider, before discounting what nature has to offer, what it would be like to be blind. Think what light and form really mean to us. Things that seem so commonplace are really things of beauty. Strangely enough, when they are well drawn they seem even more beautiful, for they have been set apart from the endless multiplicity of nature. A good drawing of a thing can be more interesting than the thing itself, for it concentrates attention on aspects which the layman probably would not see. Flowers in a vase are beautiful, but seen with the painter's vision they can be even more beautiful. A head is just another person to the layman until it is beautifully drawn or painted.

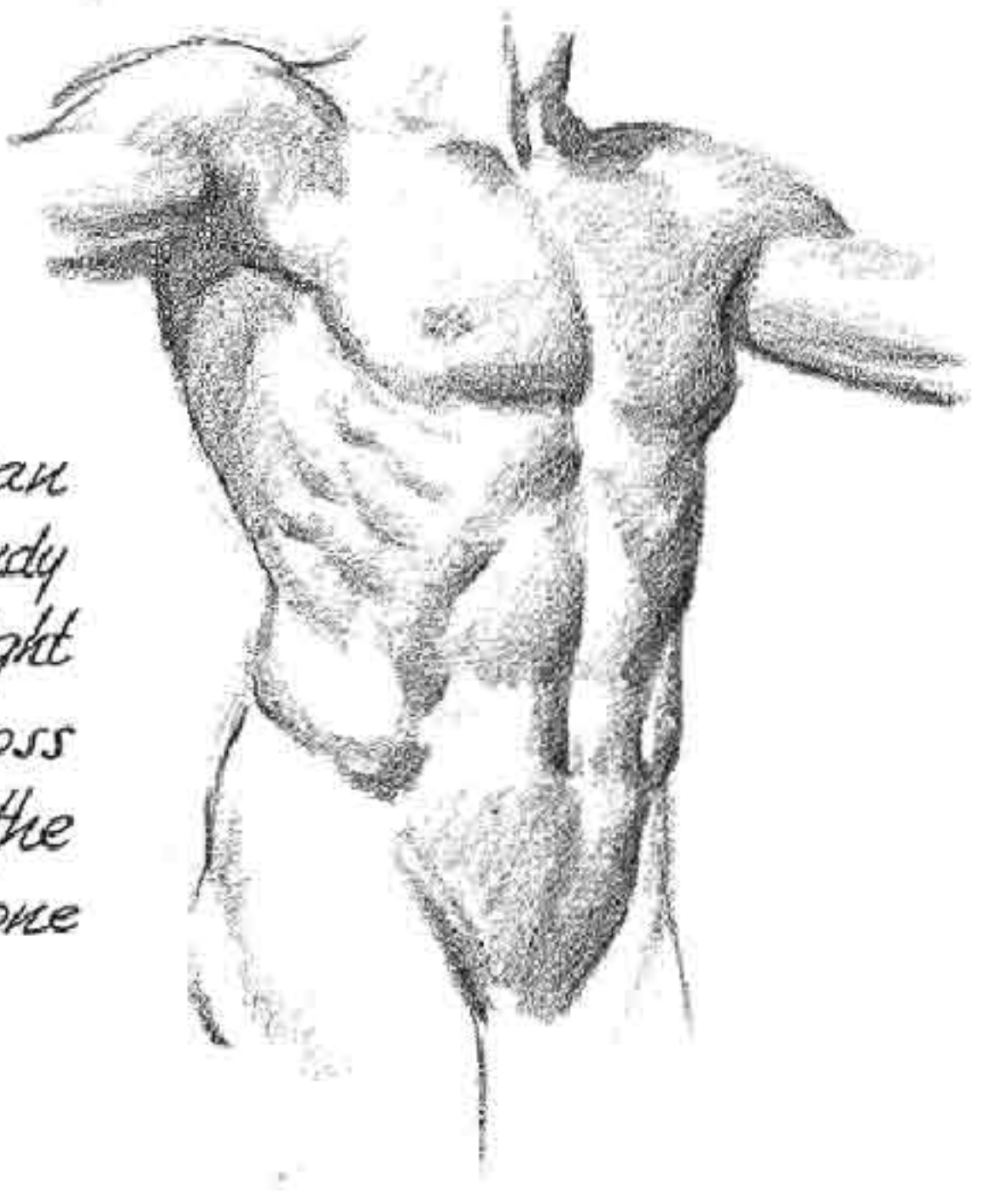
We have no lack of material. Plus all the things in nature, we have all the man-made things that have become a part of modern life. We have thousands and thousands of effects, so many worth setting down, so many worthy of study. The artists of today will all have had their yesterday before too long. Some of you students will be in their places. You will be living in the same sunlight they lived in, with all of nature now yours instead of theirs. You will live among new names and faces but with the same kinds of people doing and thinking much the same things. To appeal to those people you will have to give them credit for intelligence, for awareness of life and nature. Crudity and distortion will not be any more appreciated fifty years hence than they are now. If you can achieve truth, no man can discredit you.

I cannot believe that art devoid of fundamentals, structural knowledge, and some sort of beauty, can endure. Since we as human beings cannot do otherwise than live with nature and her laws, I wonder if art can do otherwise. I believe that the artists of the future will know much more about nature than we do, and that the knowledge will lead to greater art. Increasing understanding has led to the principles we use now. Let us attack the material before us with the feeling that additional knowledge can bring only added power.

There is little about pencil technique that can be taught. But it may be a help to the student to understand some of the things his pencil will do. I have always favored a soft pencil and do not like to use different grades or hardnesses within the same drawing. I like a large lead, sharpened to a long point, capable of standing considerable pressure. The point may be laid nearly flat on the paper by holding the pencil under the hand and using the arm and wrist rather than the fingers for the stroke. The tip of the point may be used for lines, such as out-

Good drawing begins with a search for simple basic forms.

With the basic forms established, we can then build on the surface forms.



Then, since only light can define form, we must study carefully what the light does as it travels across the surfaces, noting the areas of light, halftone and shadow.

As the form turns away from the light it produces halftone and shadow. The lightness or darkness of the halftone is the result of the angle of the plane in relation to the direction of the light. Shadows occur only when the light cannot reach the plane.

lines or contours, and the flat side for shading or grays. For the effect, see page 24. The drawings in this book were done with the Eagle Pencil Company's Prismacolor Black 395 to obtain good blacks for reproduction, since all dots on a line cut must be black.

Different papers give different effects. The paper used for these drawings was Coquille Board, a grainy paper meant for this kind of reproduction.

There are also carbon pencils, crayons, charcoal, anything you want. Drawing is drawing in any medium; select the one you like best. You can buy large pads of layout bond paper, which is not too thin and transparent. Get a box of kneaded rubber, or the plastic type of eraser. The pencils I have used do not erase readily, so for a while it might be best to stick to the regular graphite or lead pencils.

My only suggestion as to the technical use of the pencil is to try to avoid scratchy, small, and thin-lined strokes for your grays and blacks. They persist in looking amateurish and fussy or furry instead of suggesting an area of tone.

To do the perspective problems, you will need a fairly wide drawing board, a T square, and a triangle. You need not get a complete set of drawing instruments unless you intend to ink in your drawings. A pair of dividers and a pencil compass will suffice. Any ruler will do when working to scale.

The problems of lighting on form can best be solved by working from life. If you must work at night, any artificial light on your subject will give you the effect you want. However, keep the light simple, using one source. Draw anything you wish for practice — some old shoes, some pottery, some vegetables, fruits, pots and pans, bottles, bric-a-brac, toys, books, dolls, anything at all. It is all form with light on it, and all present interesting problems.

To keep your practice from getting too boring, perhaps one evening at perspective can be followed by an evening of drawing from life or copying some of the drawings in this book. Try once in a while to draw real people — some member of your family will pose for you. Spend an evening with comics — they are fun to do. There is plenty of material all about you. Do not try to make masterpieces, just sincere studies. Save your work for later comparison.

To learn to draw is to draw and draw and draw.

Note: If you wish to copy any of the drawings shown here, for practice, you may do so. However, since the book is copyrighted, no part of it may be copied for reproduction or sale.

There is hidden perspective in everything that we will ever draw, large or small.

Perspective the Artist Should Know

The pages of this book that are devoted to perspective should not be considered a side issue by anyone who is seriously interested in drawing. It may be hard to see the connection between planes and vanishing points and the kind of drawing you wish to do. But there is a definite connection, for anything you draw is related to a horizon and vanishing points, even though it is not always necessary to draw them. If you intend to make a living at drawing, by all means learn these things now, and do not have them bothering you and your work for the rest of your life. Even if you are drawing only as a hobby, the knowledge will enable you to do much better work. Remember that anything can be drawn within the cube or block. Even though you don't draw the actual block, you must feel the perspective relationship of the figure or object as it would be within a block.

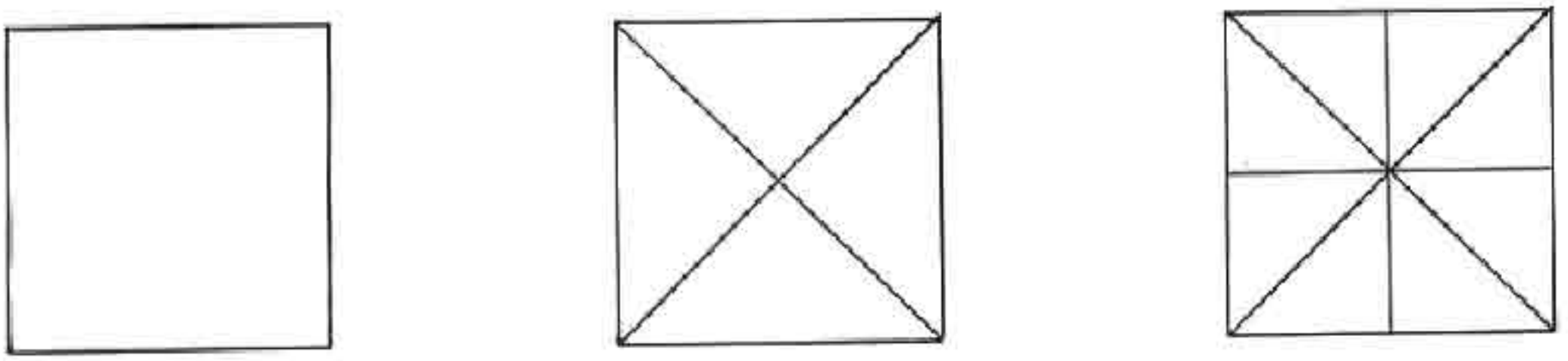
Experiment with real drawing by drawing a thing first with blocks. See how much more real construction you get into it. You will later see the tie-up between lighting and perspective, which are much more closely related than the average artist realizes.

Art students are as prone to underestimate the value of the study of perspective as music students are to underestimate the need of practicing scales. Both foundations are necessary. In drawing, the eye is as important as is the ear in music. Musicians who play only by ear are never as accomplished as those who can also read music. Similarly, an artist can draw by eye alone, but he will never draw as well as one who knows fundamental perspective. The handicap is unnecessary in either case. Since the knowledge is available, why try to struggle along without it? The difficulties of not knowing are always much greater than the effort of learning.

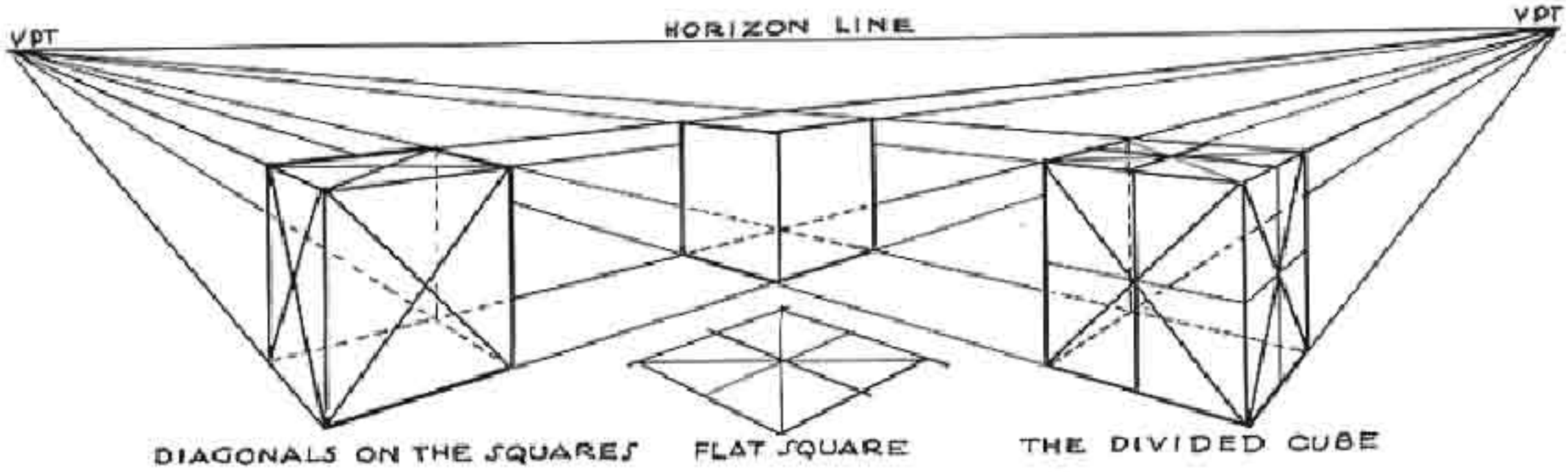
The problems in this section are not child's play. They require considerable application. But the time and effort required to digest this material thoroughly will pay dividends throughout your whole career. Although many of the important principles are presented here, space obviously does not permit complete coverage in a book of this kind, and I cannot possibly answer personal letters on problems of perspective. I urge you, therefore, to supplement this book with some good texts on perspective. A simple one to understand is *Perspective Made Easy* by Ernest Norling; you will find others in bookstores and art stores. No subject is more worthy of the artist's study.

THE SQUARE AND THE CUBE

Let us start with the beginning of all good drawing, proportion and dimension. The square with its equal dimensions is extremely important, as the following pages show. From the square we can construct nearly all other forms in perspective. The square is a basic means of measurement. We must first learn to divide the square.



We observe that two diagonals will locate the middle point of the square. Then a horizontal and a perpendicular line at the same point of crossing will divide a square (or any rectangle) into four equal parts. From this, many things will develop. First we construct the cube from the square.

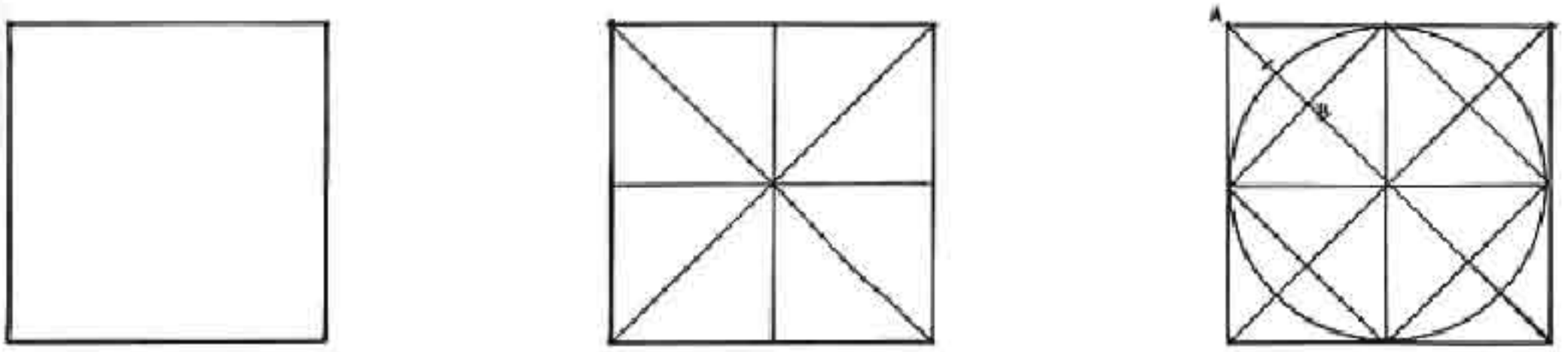


Since all objects will fit into a box, we must know how to construct the cube or block in perspective. Knowing the overall dimensions of any object, we construct a box which would fit around it. Then we build the object within it. Even round objects fit the cube or block. To draw the cube, we must establish a horizon (or eyelevel) and two vanishing points. All sides of the cubes recede toward these vanishing points.

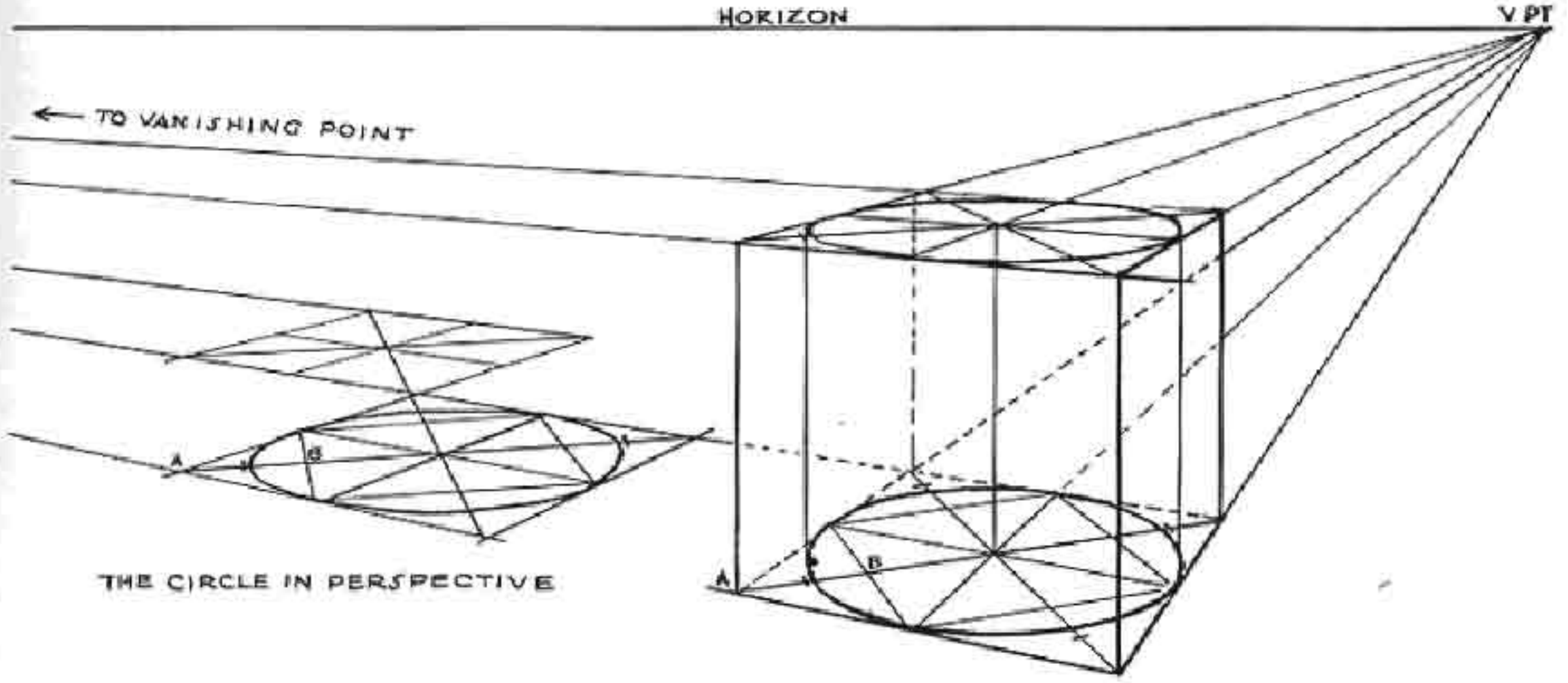
The drawing above shows the square laid flat on the ground. All ground plans begin with this. We can now build the cube on the square. The sides of the cube are divided like the squares at the top of the page, but now are shown in perspective. In the drawing above there is some distortion because the vanishing points had to be placed a little too close in order to show them both on the page. Try drawing some cubes correctly.

THE CIRCLE AND THE CYLINDER

By means of the divided square and the cube, we can draw the circle and the cylinder. We use a compass to draw the circle. The circle in perspective becomes an ellipse. We can draw the ellipse quite accurately by using the divided square drawn in perspective. This is valuable in drawing all round or cylindrical forms.



By adding diagonals to the quarters of the square, we construct another square whose corners touch the middle of the four sides. By placing a point halfway between A and B, we can judge about where the arc of the circle cuts across the diagonals, which helps us to draw the ellipse.



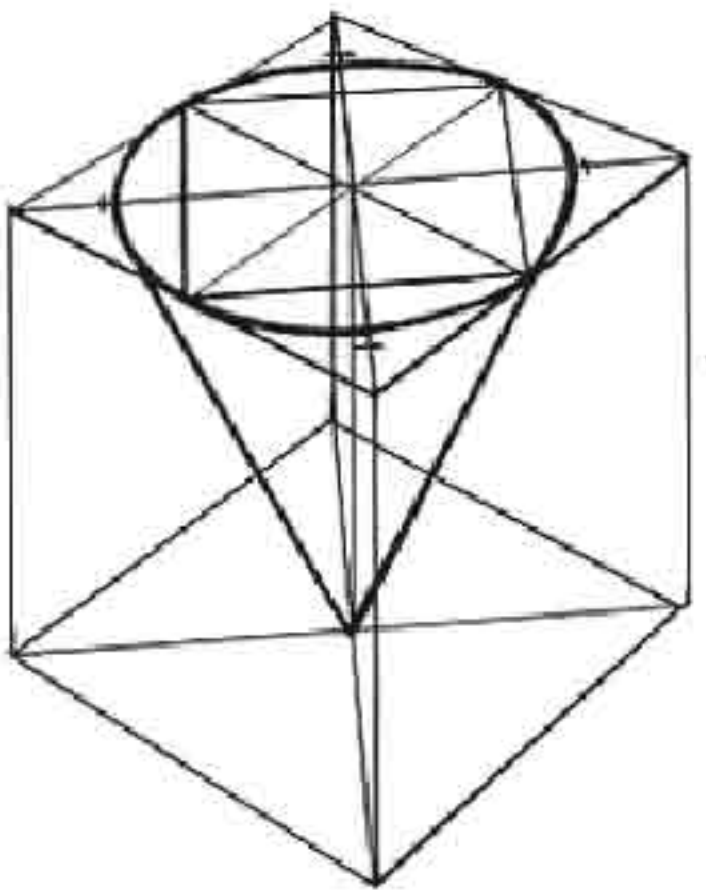
THE CIRCLE IN PERSPECTIVE

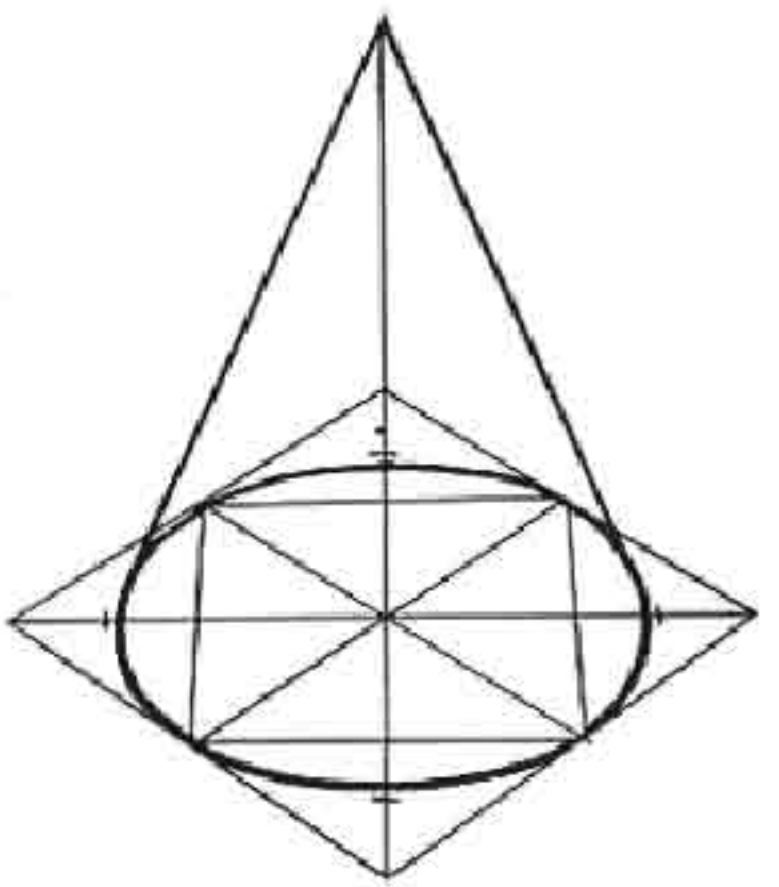
THE CYLINDER IN PERSPECTIVE

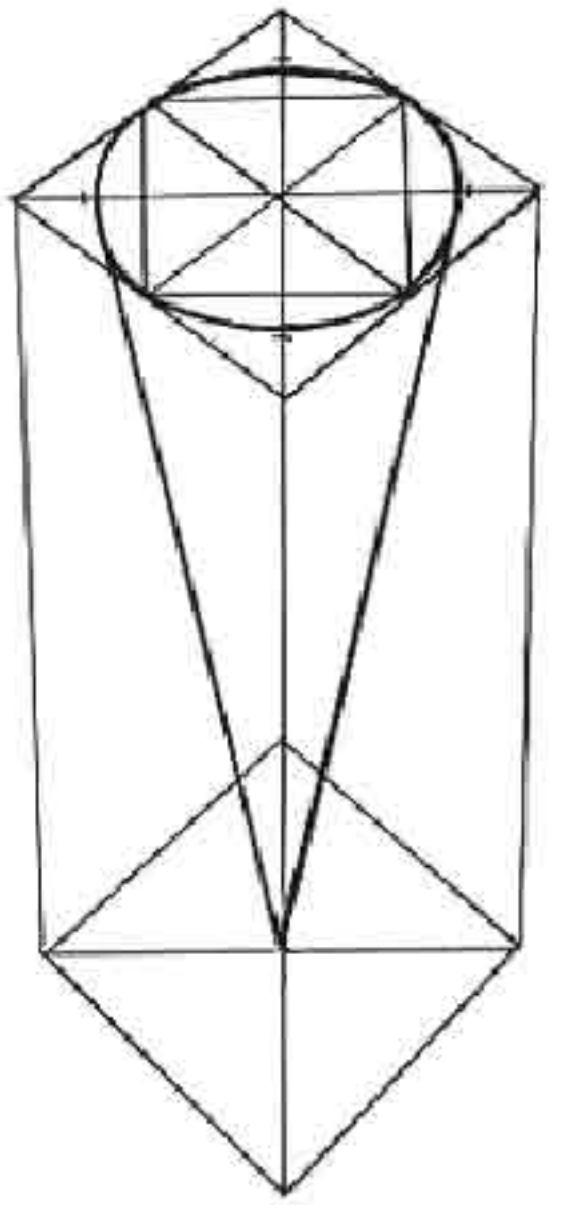
To draw a circle in perspective, we first lay out a divided square. We draw the arcs around the four sides, making the arcs cut just short of the halfway points between A and B. Now by drawing ellipses on the top and bottom sides of a cube or block, we construct a cylinder in perspective. The vanishing points for a small object should be spaced wide apart. For large objects, they can be spaced closer.

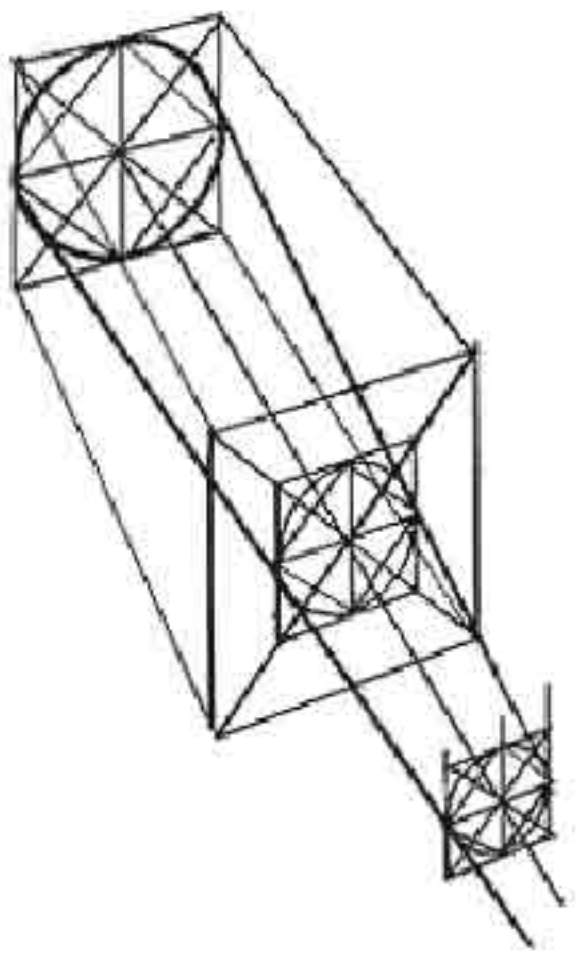
THE CIRCLE AND THE CONE

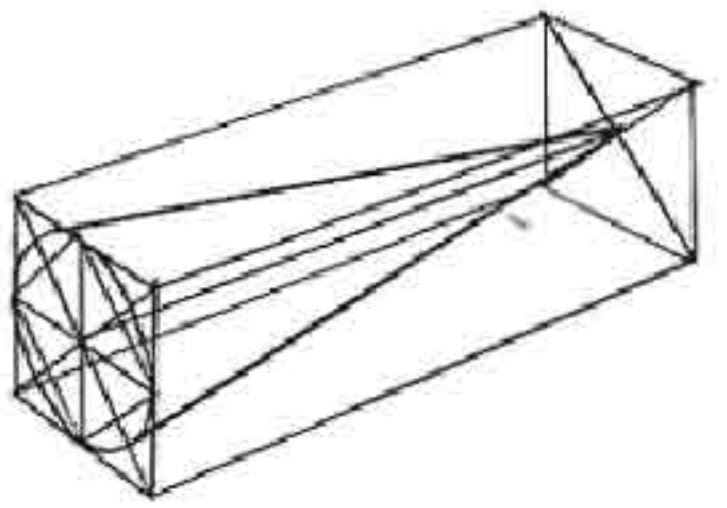
The cone is built on the circle in perspective, and the circle in perspective is of course constructed within the square. Many objects are built with the cone as the basic form, such as the wine glass, horn, etc.





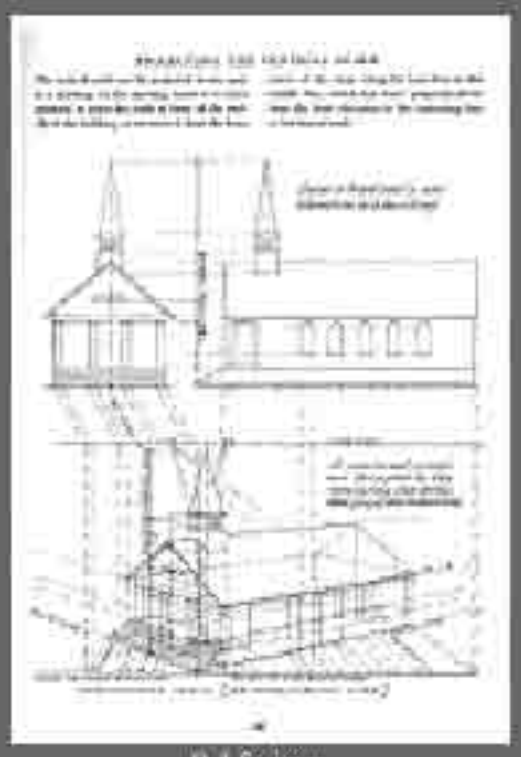






Remember that both vanishing points must be located on the same truly level horizon.

Later you will draw freehand, but at first, when you are learning the basic principles of drawing, you will always need a straight-edge to get correct perspective. So get a T square and a triangle and make all the lines true and straight. Careless drawing is the sure sign of the amateur.



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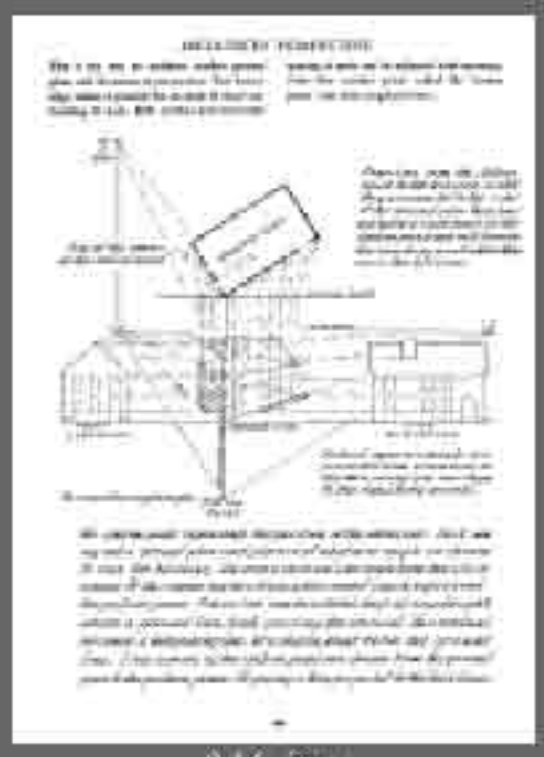

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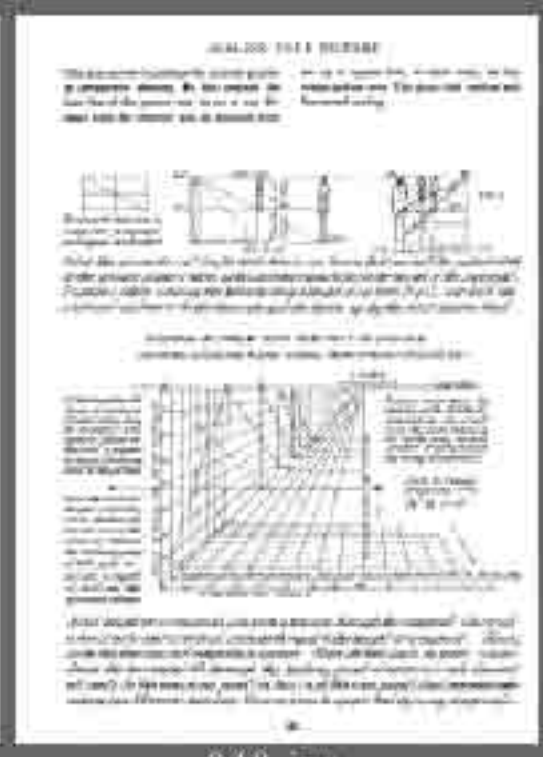

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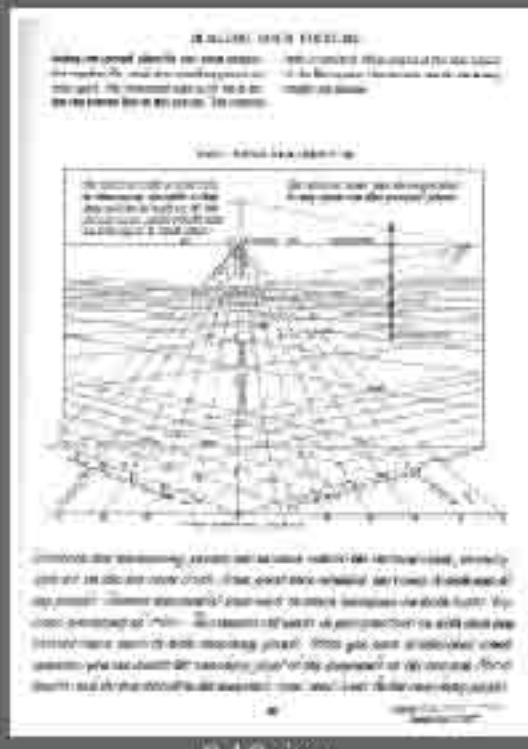

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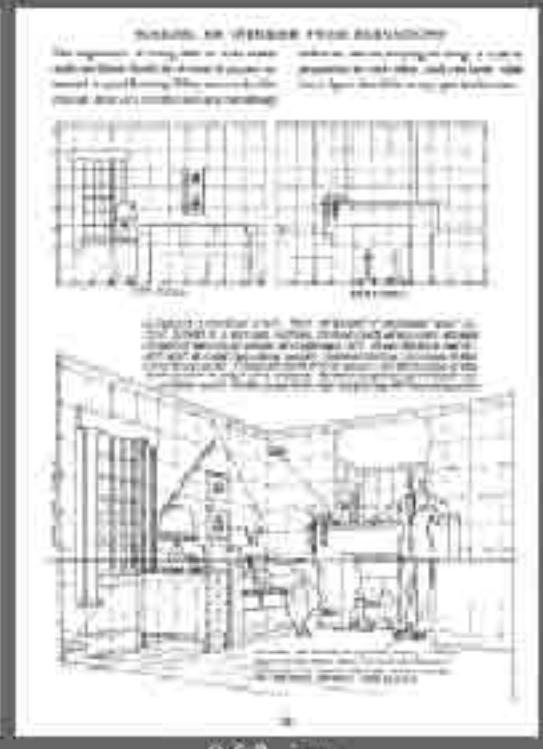

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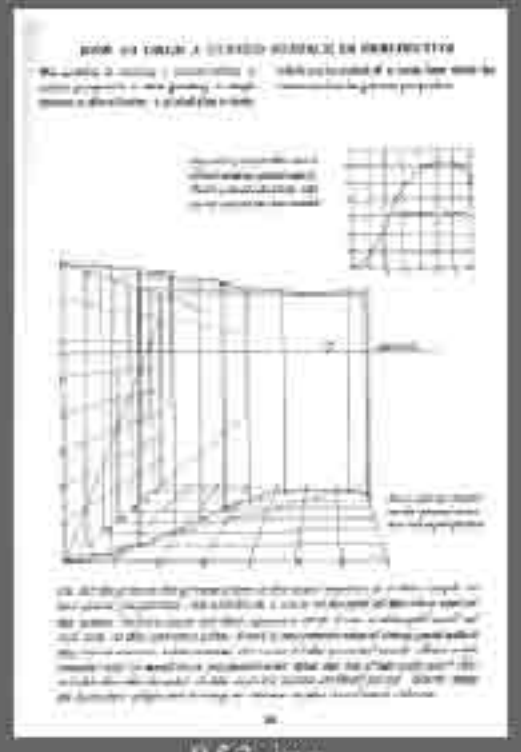

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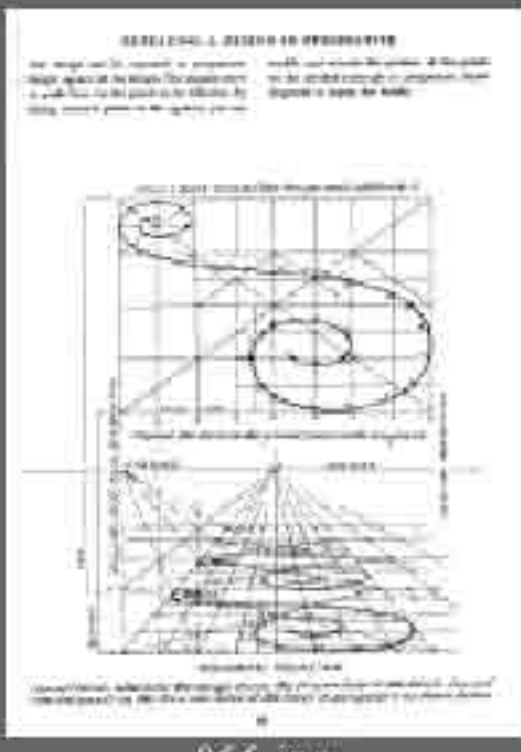

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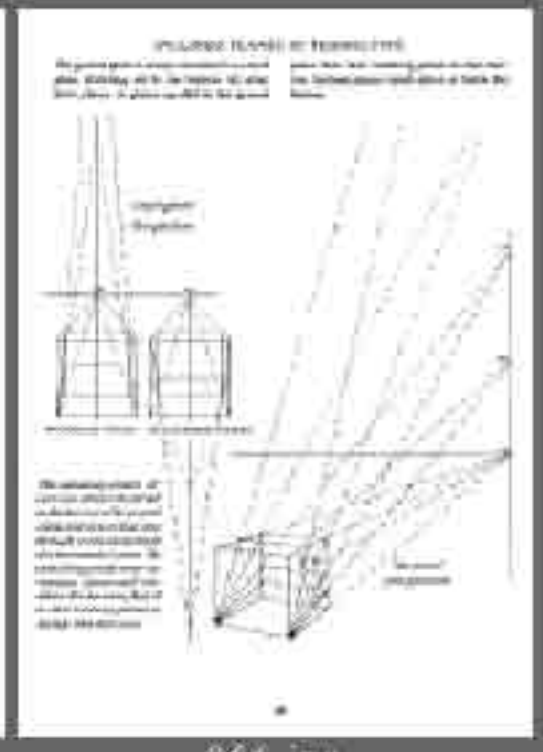

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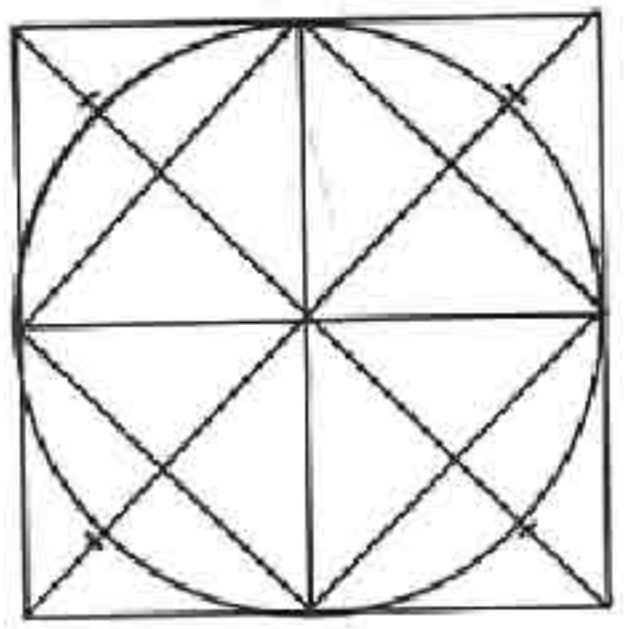
Since a circle fits within a square, a sphere will fit within a cube. First divide the cube, then draw the circle plan in perspective horizontally across the middle section of the cube (Fig. 1).



THE CIRCLE PLAN

THE DRAWING BELOW SHOWS
THE CIRCLE PLAN LAID OUT ON
THE MID-HORIZONTAL PLANE
AND ONE OF THE DIAGONAL PLANES

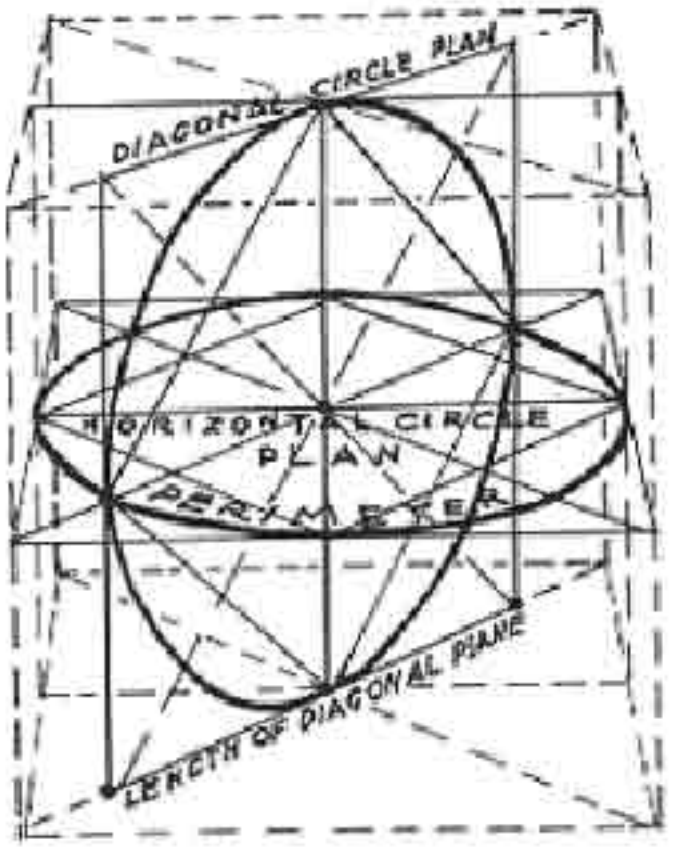


FIGURE ONE

Then draw the circle plan on the upright diagonal planes. The length of these planes is determined by the perimeter of the horizontal circle.

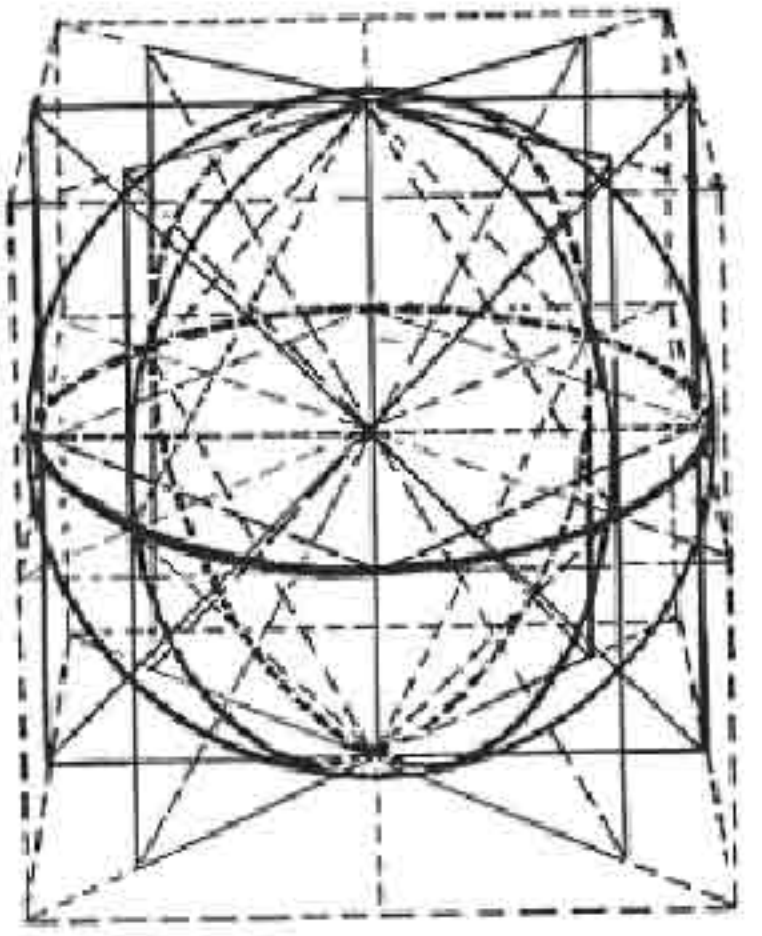
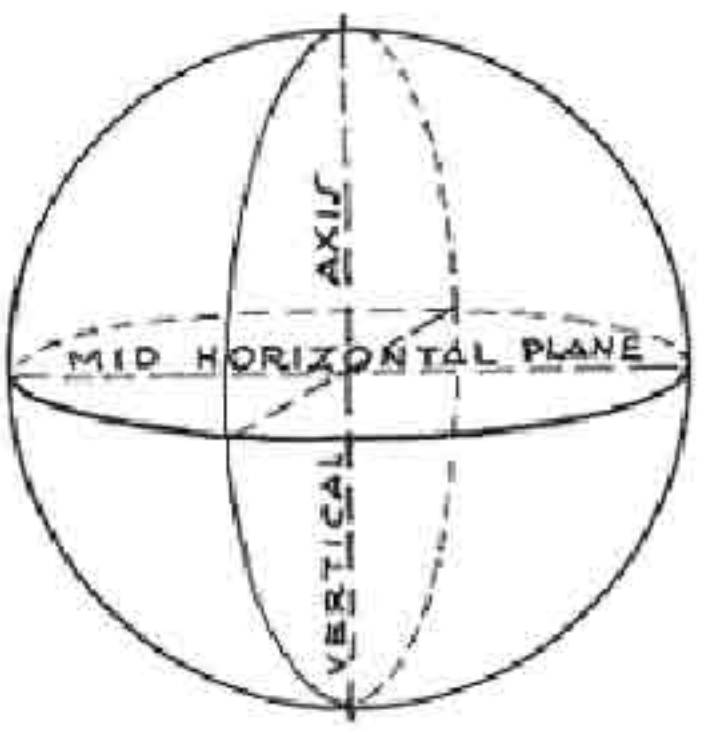


FIGURE TWO
THE CIRCLE PLAN LAID ON ALL PLANES
THUS PRODUCING A DIVIDED SPHERE

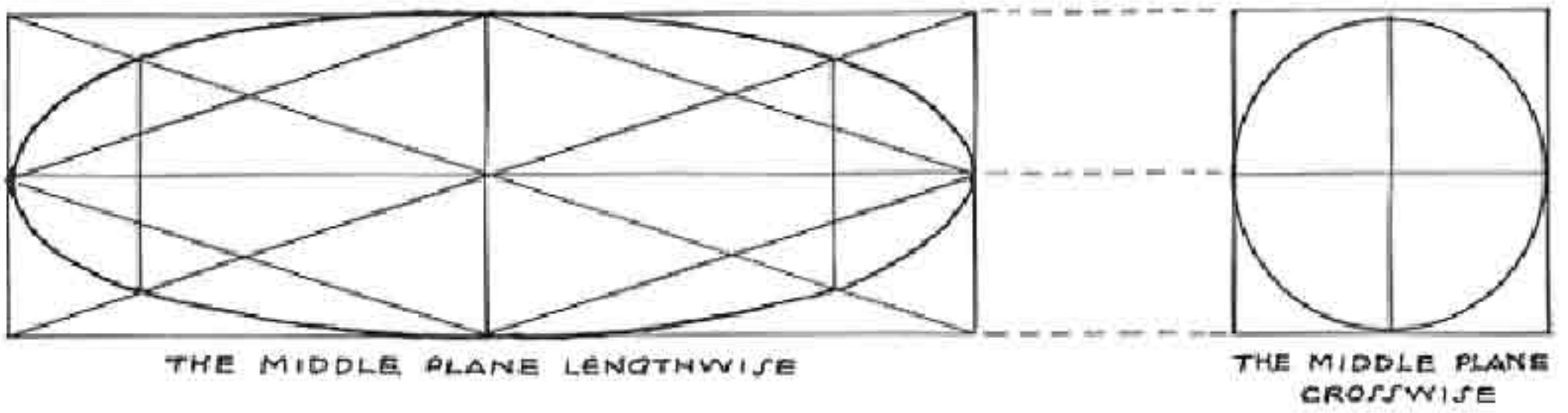


TWO INTERSECTING CIRCLES
WITHIN A SPHERE

When the circle plan has been laid out on the mid-horizontal plane as well as on all vertical planes which pass through the vertical axis, a perfectly divided sphere will result. The contour of a sphere never changes, though the lines of division are affected by perspective (Fig. 2).

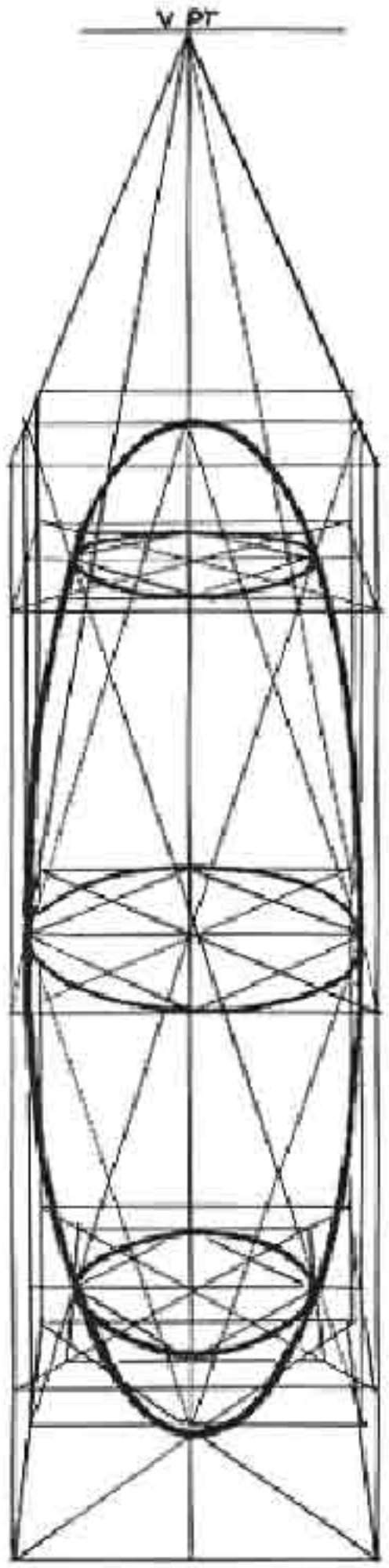
ROUND FORMS WITHIN THE BLOCK

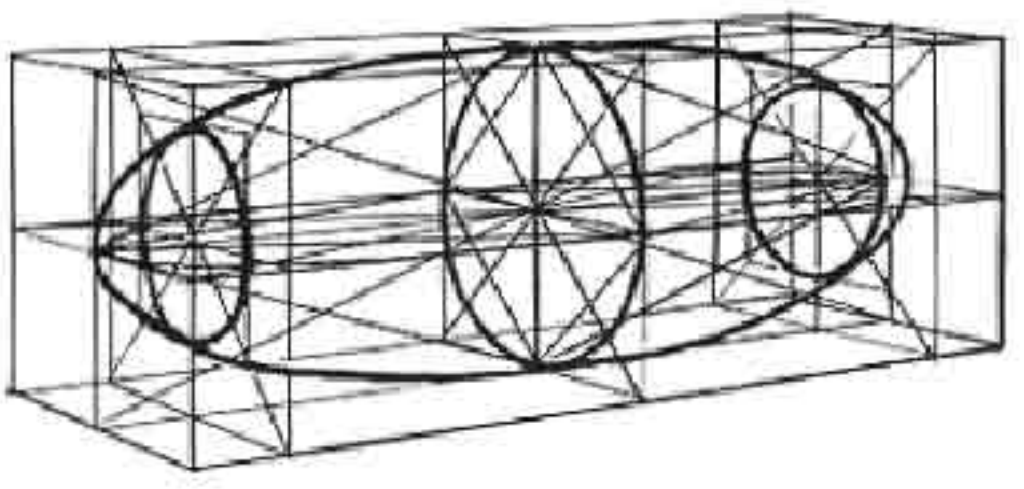
What is true of the cube and the sphere is also true of any elongated block that will fit around any rounded form. Any such form can be drawn in accurate perspective by using this basic approach. First draw plans of the middle planes of the block.



THE MIDDLE PLANE LENGTHWISE

THE MIDDLE PLANE CROSSWISE

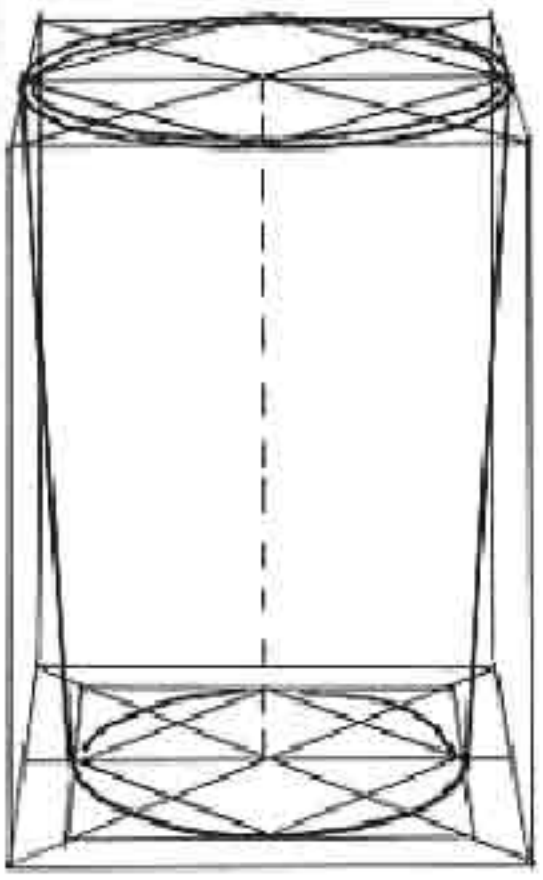


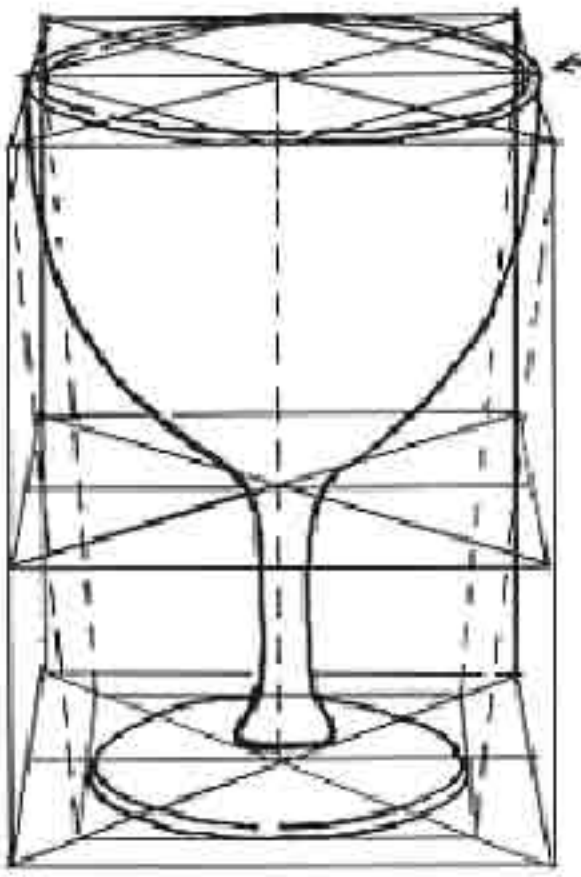


The drawings here indicate the soundness of this approach to good drawing. The whole principle of perspective drawing is to enable the draftsman to get at the inner construction and to relate all sections or parts to a single viewpoint. The mechanic builds from plans which are cross sections through the object. These are usually flat plans like the two at the top of this page. Having such plans, we can draw them to a horizon and vanishing points, showing the object in three dimensions.

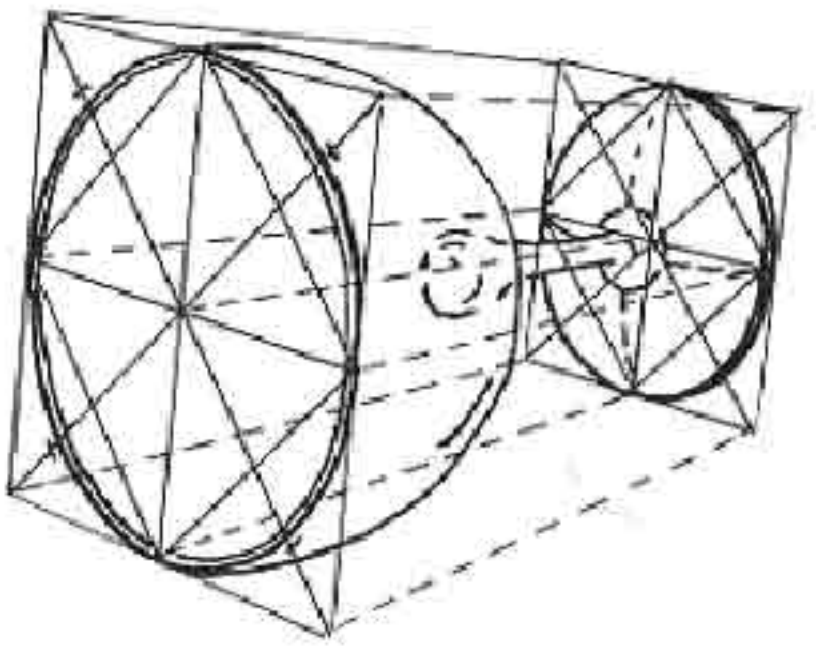
THE BLOCK APPLIED TO ROUND OBJECTS

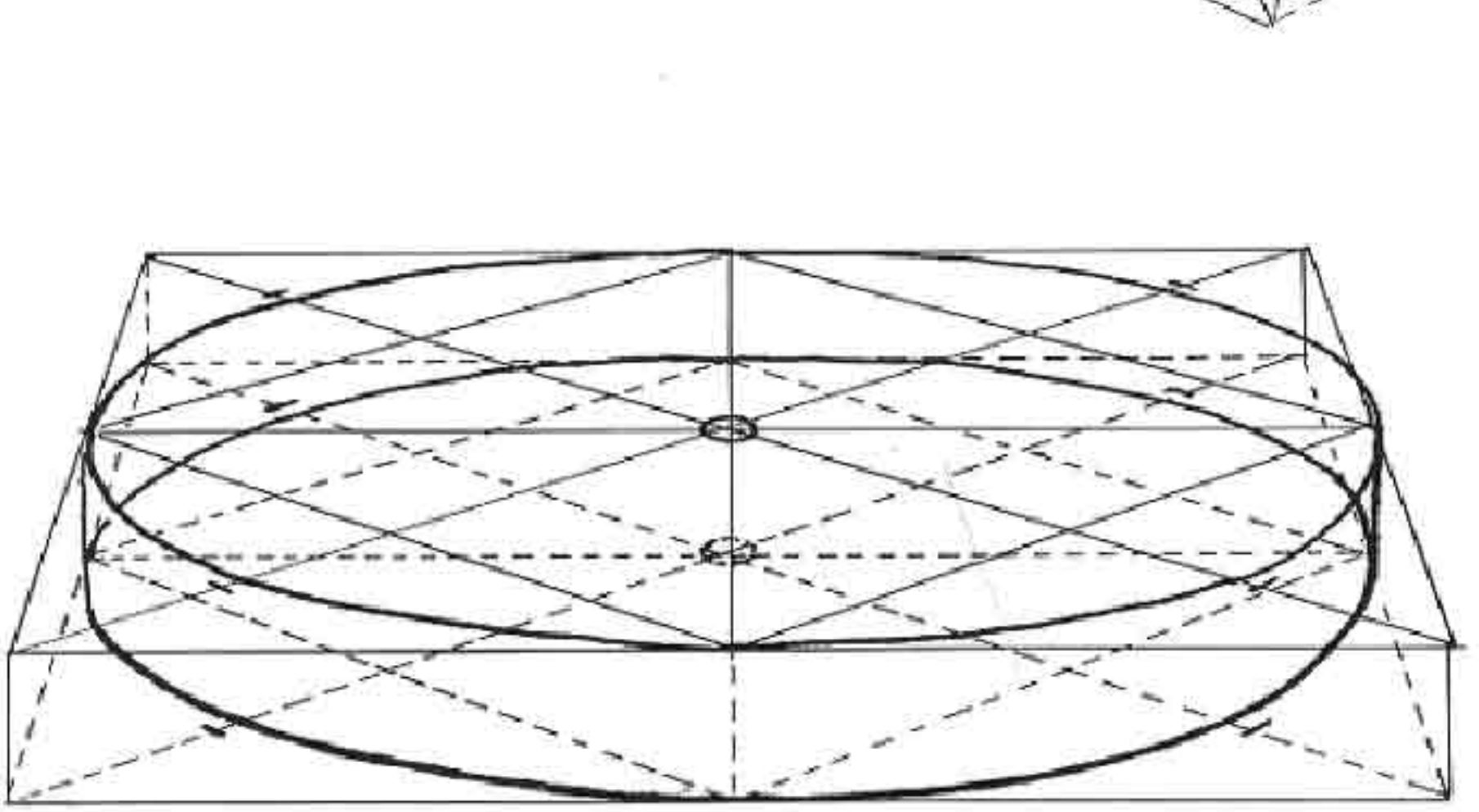
The circle and the block can be applied in drawing many different objects. If you can draw the block in perspective, you can draw almost any object in any position within your subject. Draw the block to equal the height, width, and depth of the form.

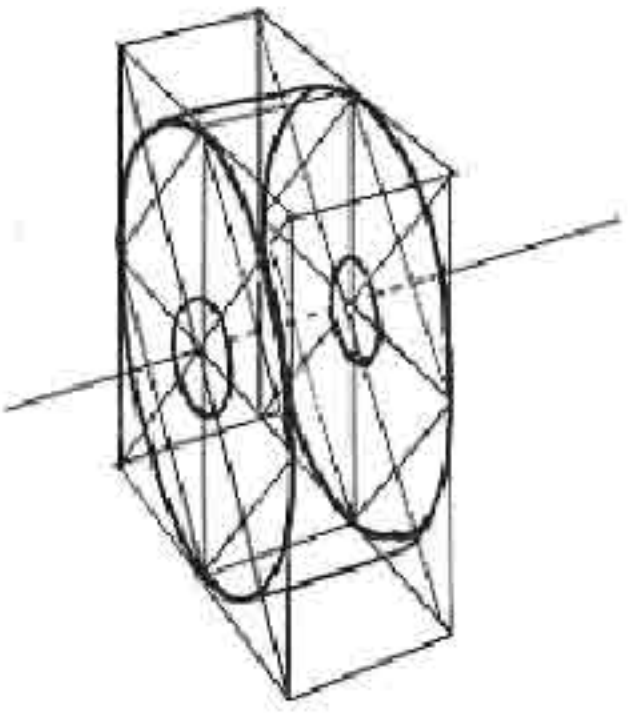




Draw the ellipses freehand



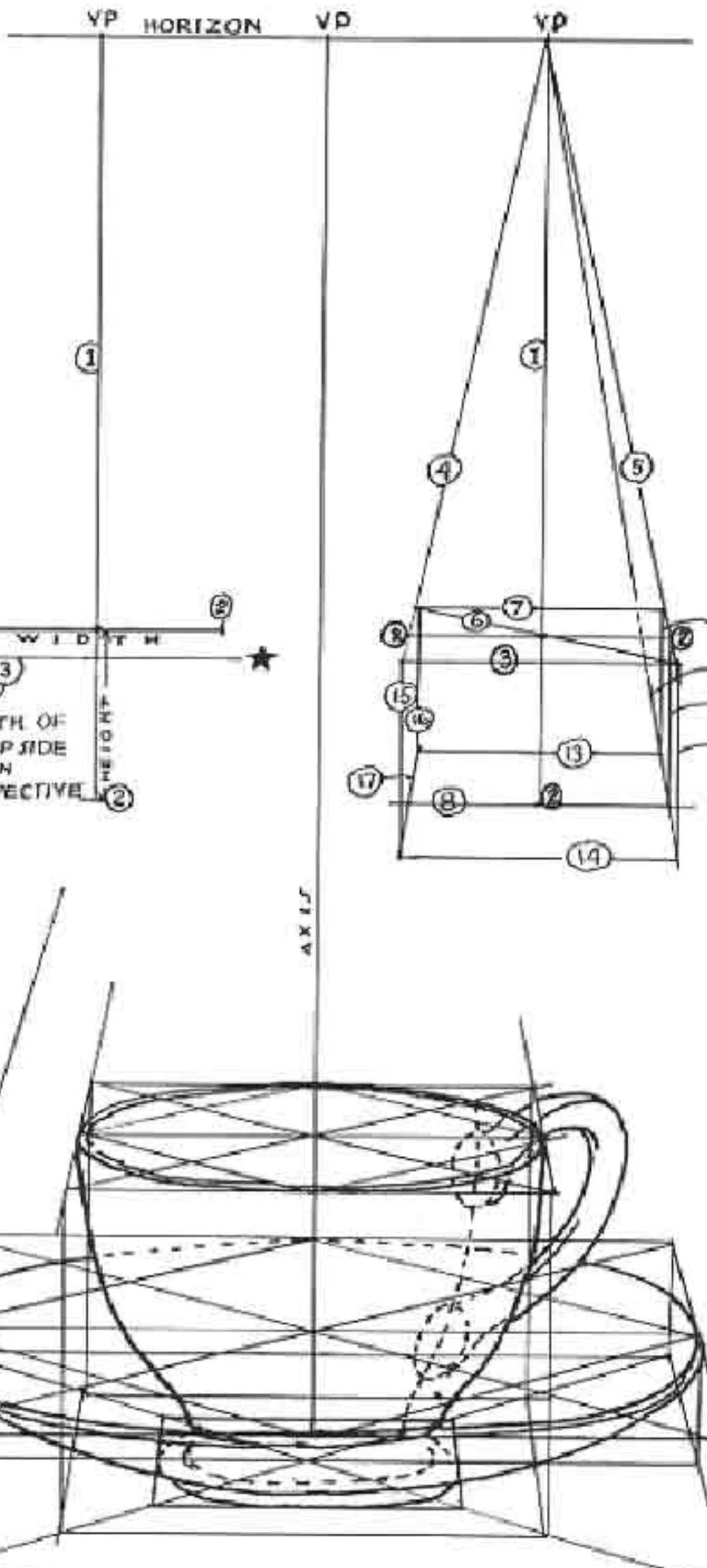




The disk is a flat version of the cylinder. Since it has many uses, it is well to know just how the ellipses should be drawn to fit any object at any viewpoint and from any eyelevel.

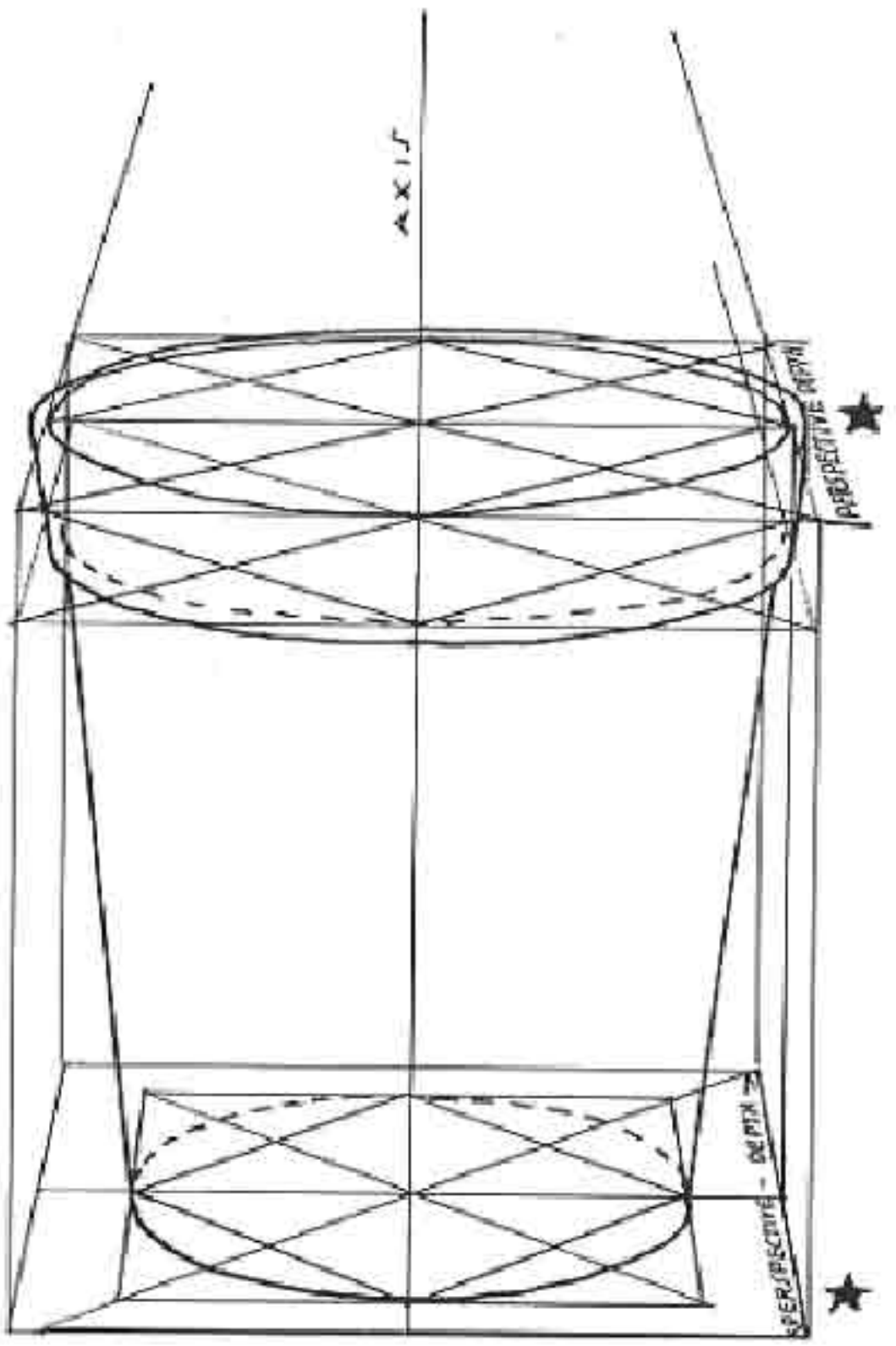
HOW TO CONSTRUCT THE BLOCK CORRECTLY

In case you are having trouble in drawing blocks correctly, the drawings below will help you. Remember that ellipses narrow as they near the eye level. Studying a real object will help you approximate this. The perspective depth* of the top side of the block determines the perspective depth of the bottom side.



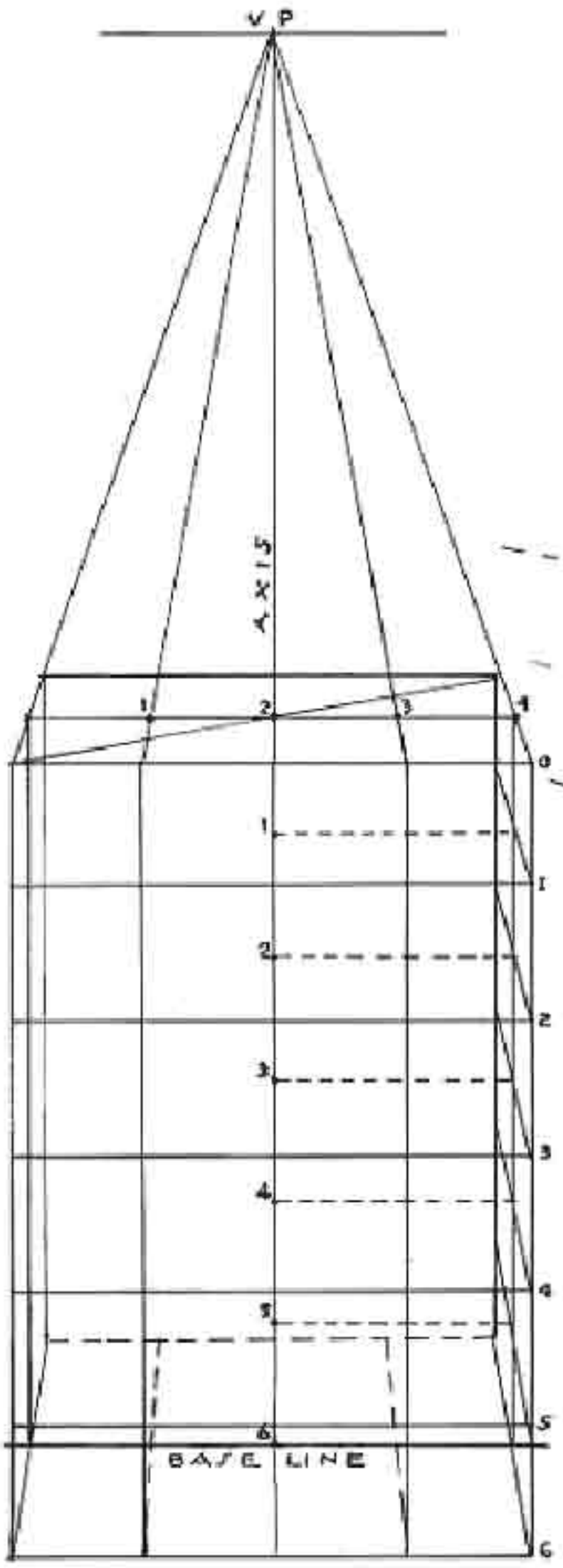
How to construct a block of given or desired dimensions

You need a T square and a triangle. Establish a horizon or eyelevel. Draw a perpendicular ①. Establish height and width of block ② on the perpendicular. The depth of ½ of the top side in perspective ③ is optional. Through the points established at ends of line ② draw connecting lines ④ and ⑤ to the vanishing point above. Then draw the other lines in the order indicated by their numbers.*

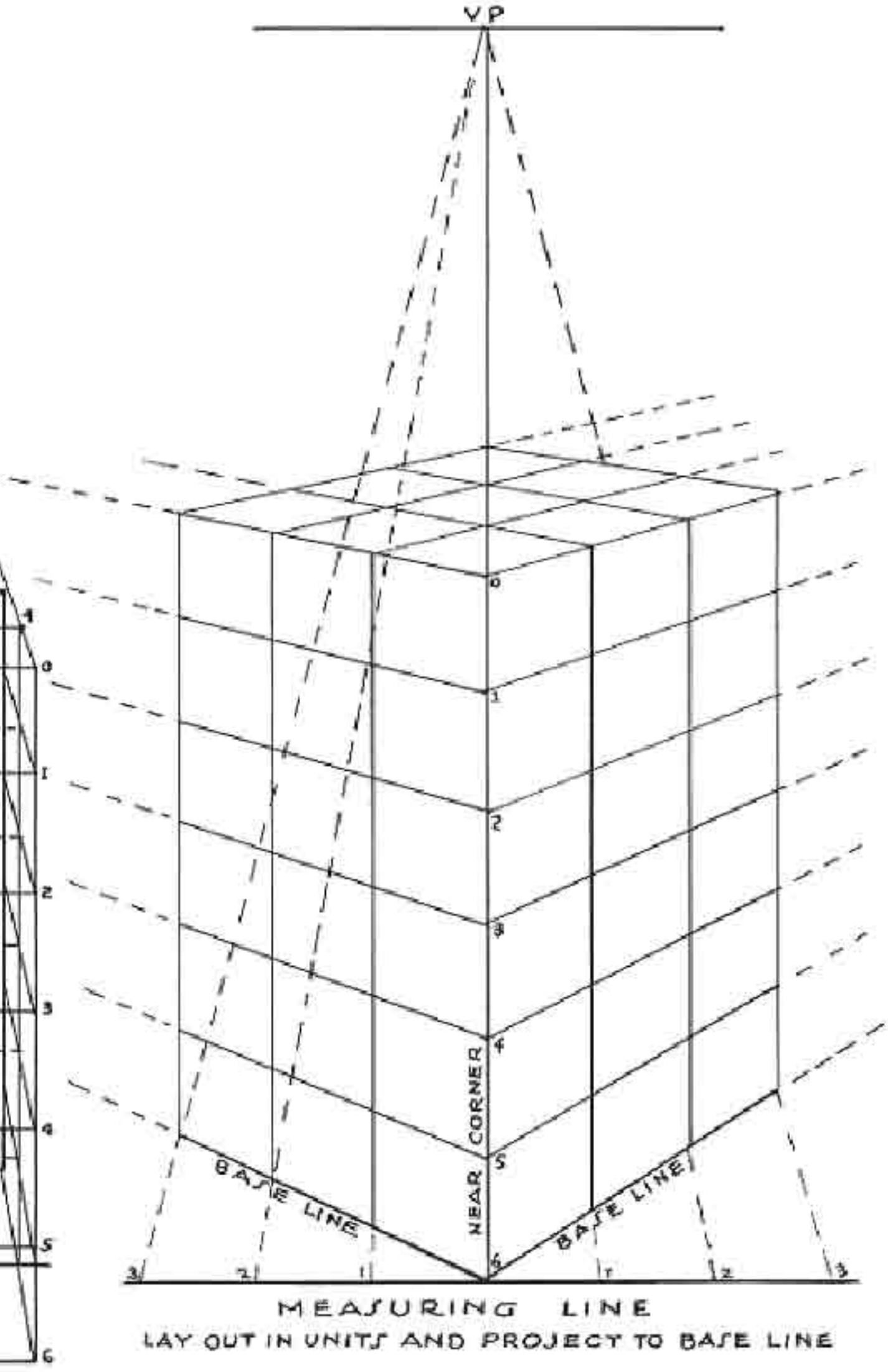


BLOCKS OF SPECIFIED DIMENSIONS

Here are two ways of constructing blocks of specified dimensions. In the drawing at the left, the dimensions are laid out on the middle line or axis, using the procedure shown on the preceding page. In the one on the right, we establish a measuring line touching the near corner, then carry the units to the base line.



UNITS ARE PROJECTED TO THE FRONT PLANE OF THE BLOCK

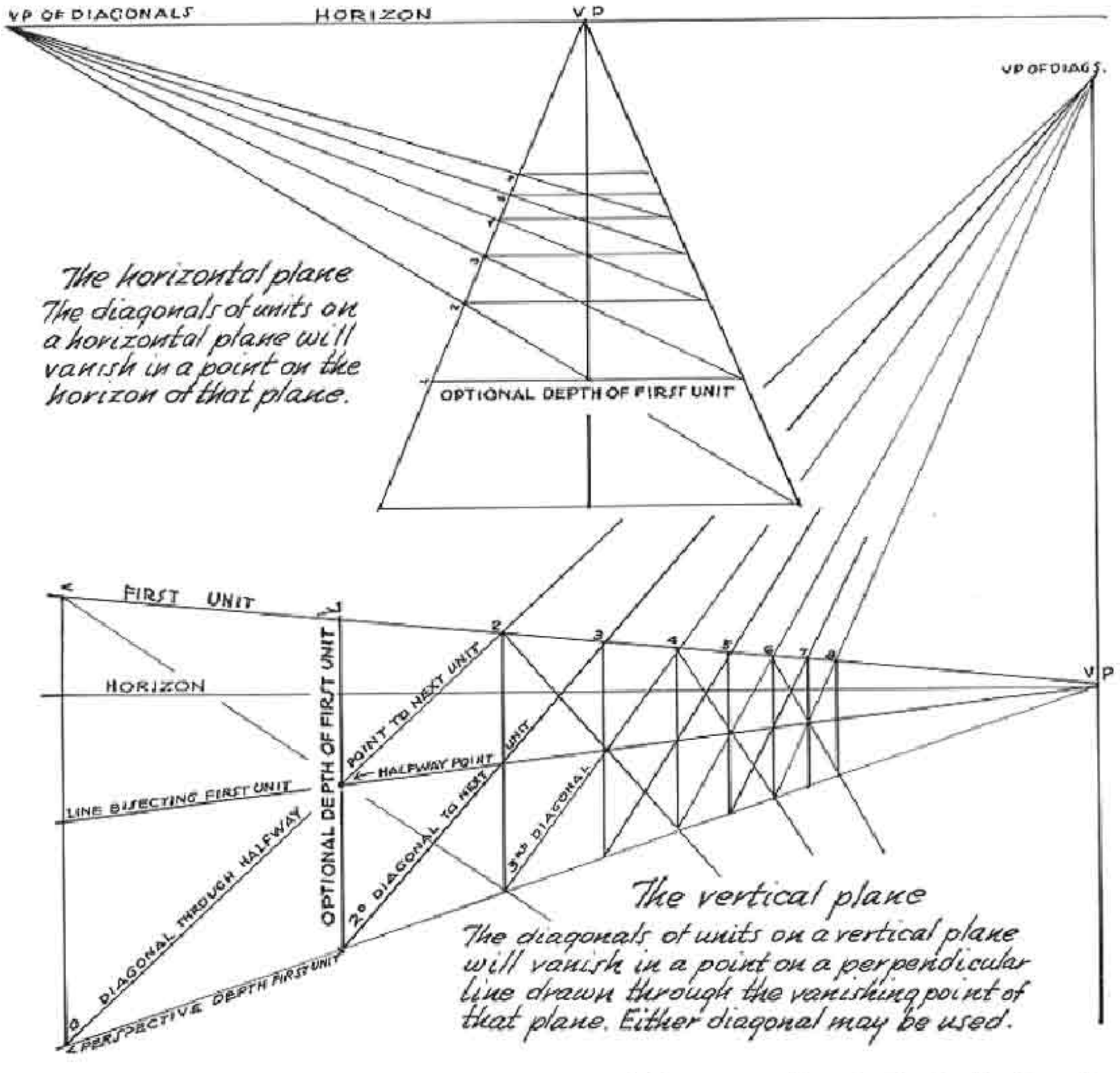


MEASURING LINE
LAY OUT IN UNITS AND PROJECT TO BASE LINE

When you can produce a block of specified dimensions, you have the basis for drawing any object accurately. You are urged to practice this until you can do it, because it is a procedure that you will use for the rest of your life. We progress from this to other methods of measurement in perspective.

MEASURING DEPTH BY MEANS OF DIAGONALS

The drawings below show how to space off equal units in perspective within both horizontal and vertical planes. This is valuable in drawing evenly spaced units that recede toward the horizon. It will enable you to space correctly such things as units of rug designs, fence posts, telephone poles, trains, window panes, blocks in sidewalks, building blocks, bricks, roofing, wallpapers, etc.



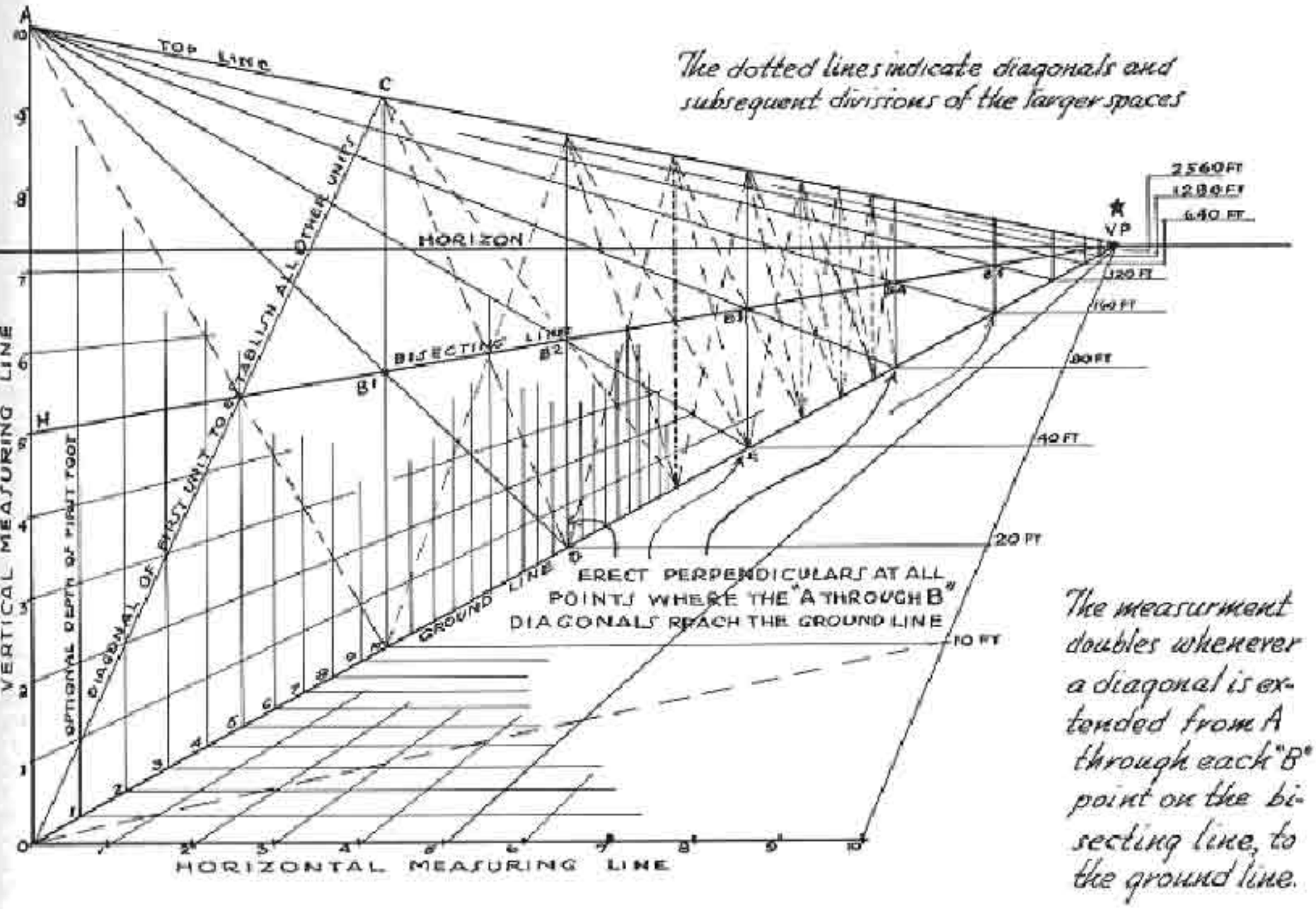
The horizontal plane
The diagonals of units on a horizontal plane will vanish in a point on the horizon of that plane.

The vertical plane
The diagonals of units on a vertical plane will vanish in a point on a perpendicular line drawn through the vanishing point of that plane. Either diagonal may be used.

In any perspective drawing we must set the perspective depth of a first unit, because it's appearance is affected by the distance from which we are viewing it. It's perspective depth changes with every step we take toward or away from such a unit or area. When the first unit is established, we repeat it by running a diagonal through a halfway point of the unit to either the top line or the baseline. This marks off the next unit, as o through 1 to 2, 2 to 3, etc.

DRAWING TO SCALE

Every artist should know how to draw to a scale. Scale drawings usually require the division of vertical and horizontal planes into square feet or square units. By the plan shown here, we can quickly divide such planes into squares of any dimension. Here we take a unit of 10 by 10 feet. We measure with this unit as far back as 2500 feet, which is as much as you will ever need. This is very valuable to you.

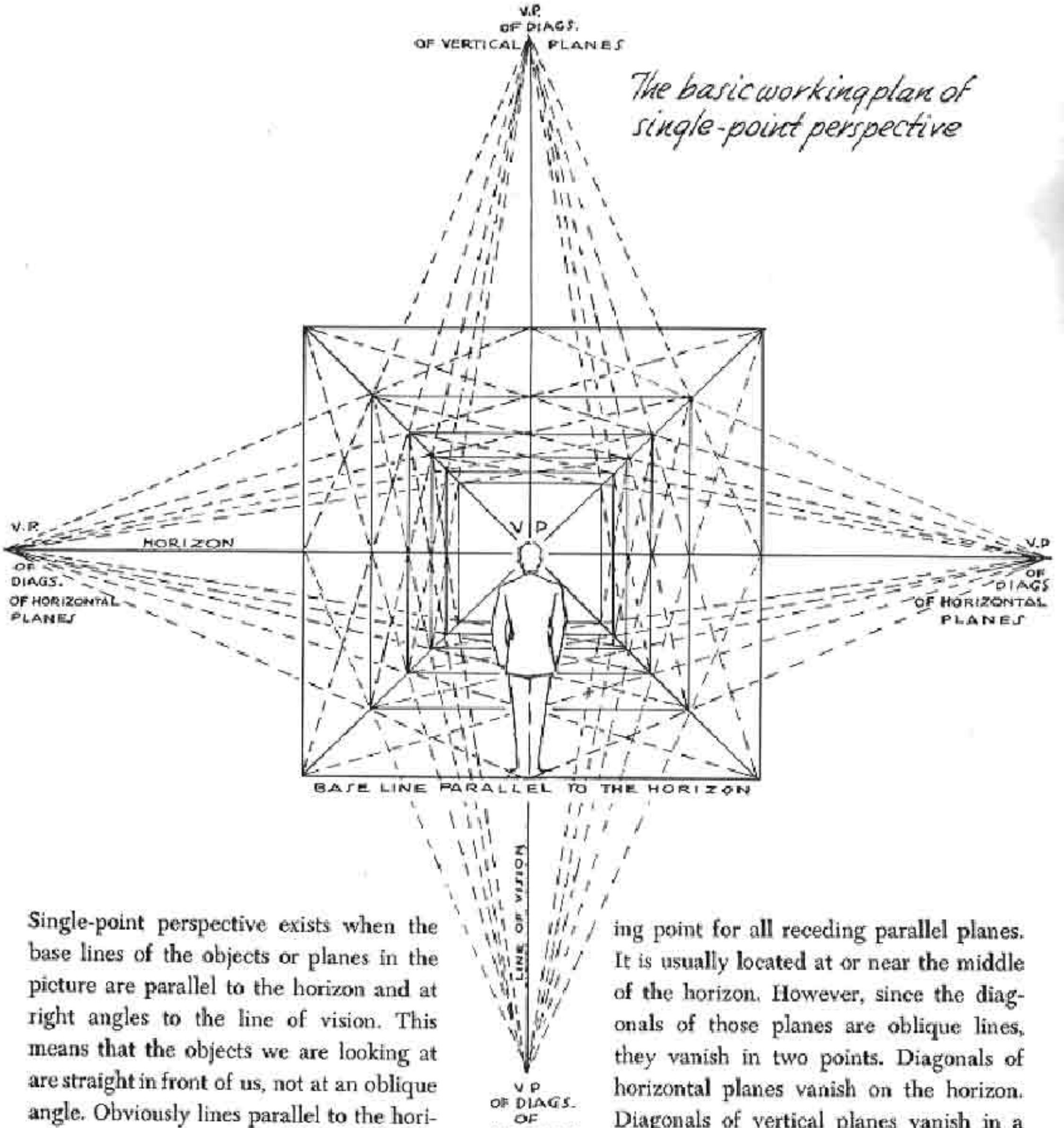


How to scale a vertical and a horizontal plane

We must first establish a vertical and a horizontal measuring line, touching each other at right angles, (point zero). On both lines we lay out 10 equal units to represent 10 feet. The size of a unit is optional. The horizon is then set at any desired height on the vertical measuring line. We then establish a vanishing point anywhere on the horizon. Connect points O, H and A to VP. Establish optional depth of the first foot. Then draw lines from all foot units toward VP. Diagonal of first foot (OC) marks off vertical divisions of foot units and also the first 10 ft. unit at point C. Diagonal "A through B' (on the bisecting line) to D" marks off 20ft. on the ground line. Then AB² to E is 40 ft, and so on to infinity.*

DIAGONALS IN SINGLE-POINT PERSPECTIVE

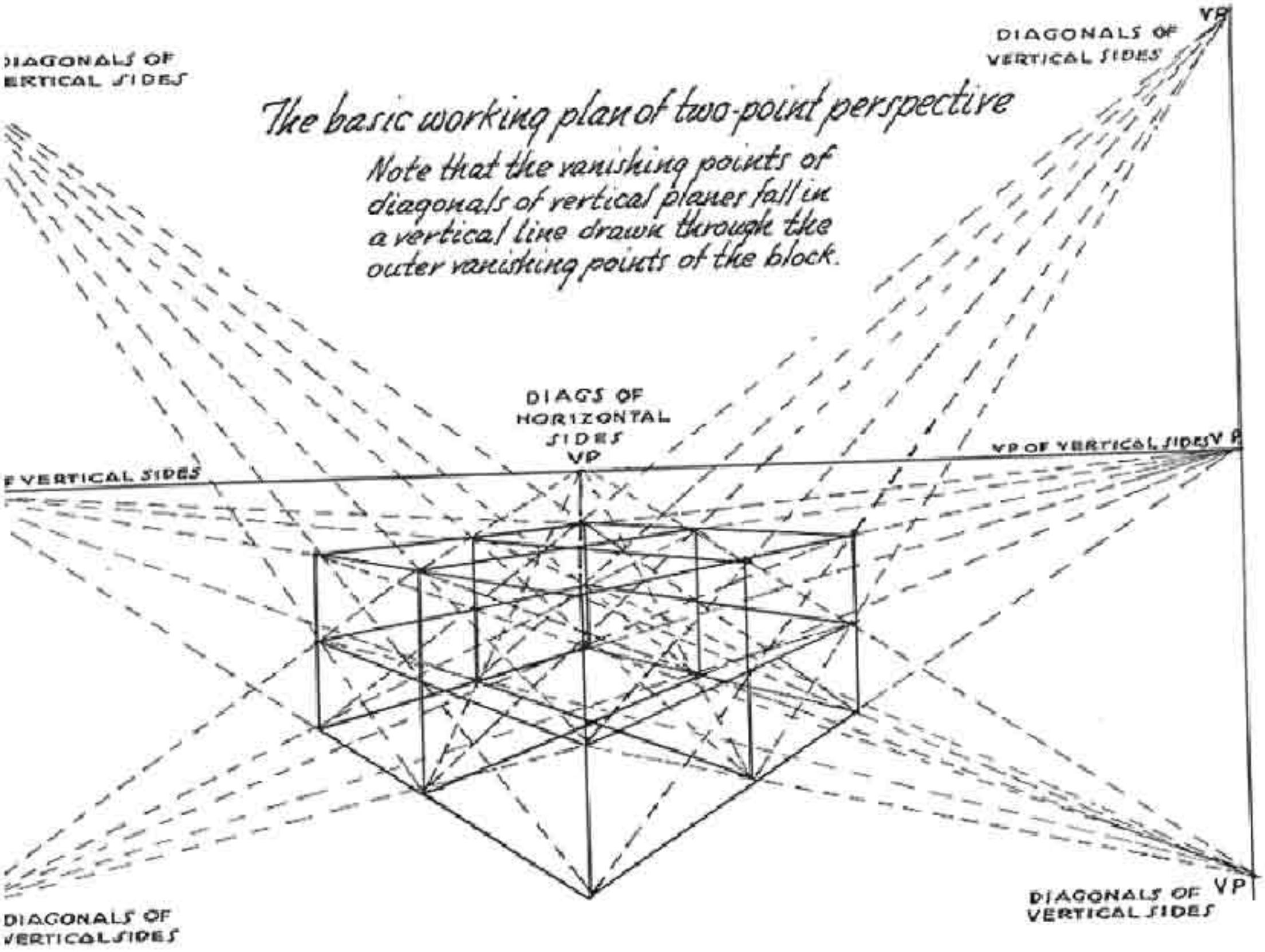
It is very important to understand what is meant by a single-point perspective and two-point perspective and how the planes and their diagonals operate in each. The basic plan for single-point perspective is shown below. Although we do not need all the diagonals for purposes of measurement, we should know how to choose the ones we need.



The basic working plan of single-point perspective

Single-point perspective exists when the base lines of the objects or planes in the picture are parallel to the horizon and at right angles to the line of vision. This means that the objects we are looking at are straight in front of us, not at an oblique angle. Obviously lines parallel to the horizon cannot converge to a vanishing point and therefore have none. In single-point perspective there is only one main vanishing point for all receding parallel planes. It is usually located at or near the middle of the horizon. However, since the diagonals of those planes are oblique lines, they vanish in two points. Diagonals of horizontal planes vanish on the horizon. Diagonals of vertical planes vanish in a vertical line drawn through the main vanishing point.

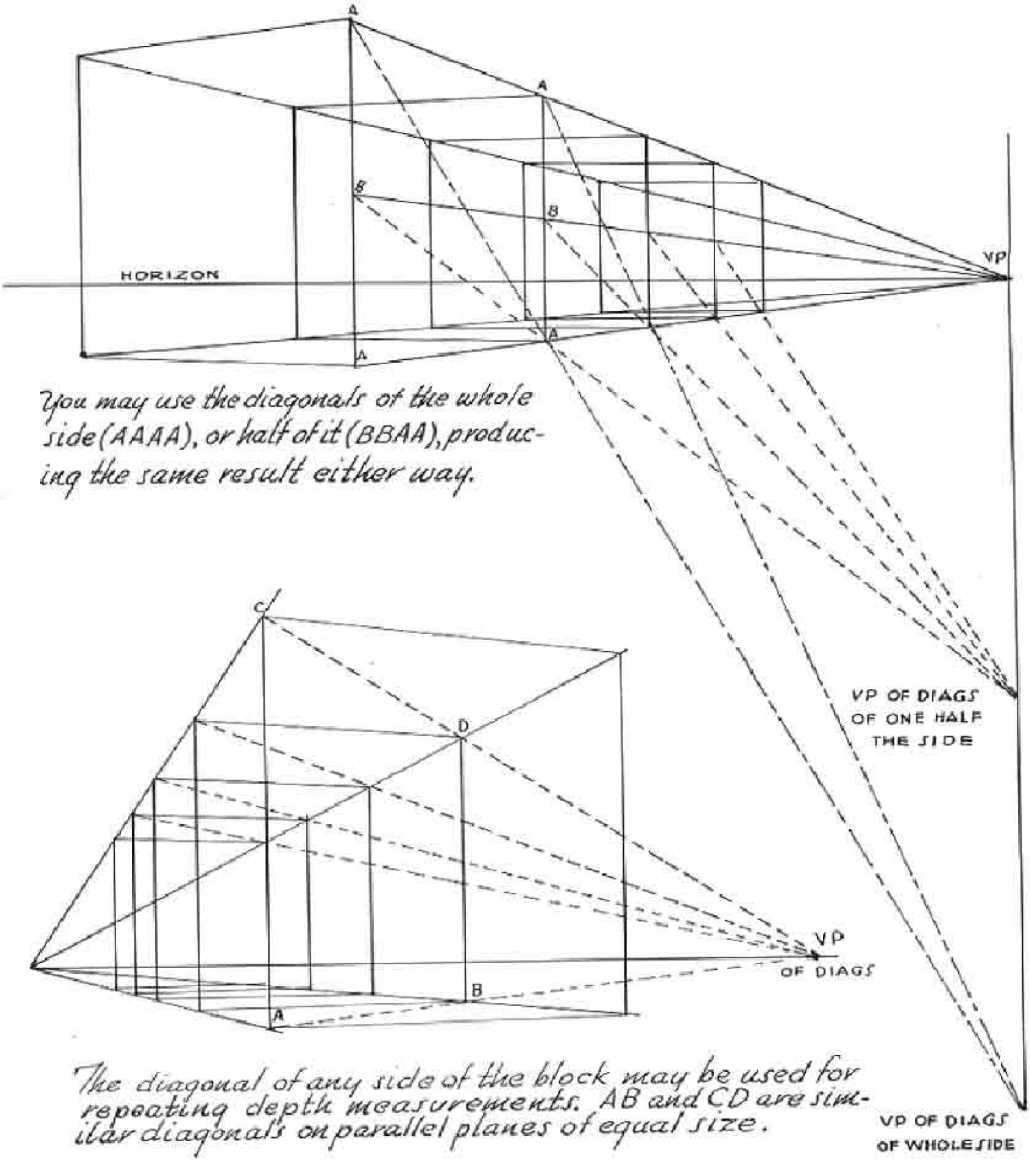
drawing below, while it appears to be complated, is simple when you understand it. We e divided a block into sections of four units side and carried all the diagonals to their proper vanishing points. This is seldom necessary, but it illustrates the basic plan for diagonals in two-point perspective, and is important to know.



The vanishing point of the diagonals of the horizontal planes is located on the horizon. What is true of diagonals on vertical planes also applies to inclined planes, as we learn later, for their vanishing points also fall on a vertical line through the vanishing points of the vertical planes. It is necessary to study the drawing carefully to locate the diagonals of any particular section. Try drawing this.

EQUAL SPACING OF SOLIDS IN PERSPECTIVE

By the same method of measuring depth by means of diagonals we can also repeat a solid block, as shown below. This is valuable in drawing buildings of repeating dimensions or any row of objects that are constructed within equal blocks. Remember that all objects can be drawn within blocks.

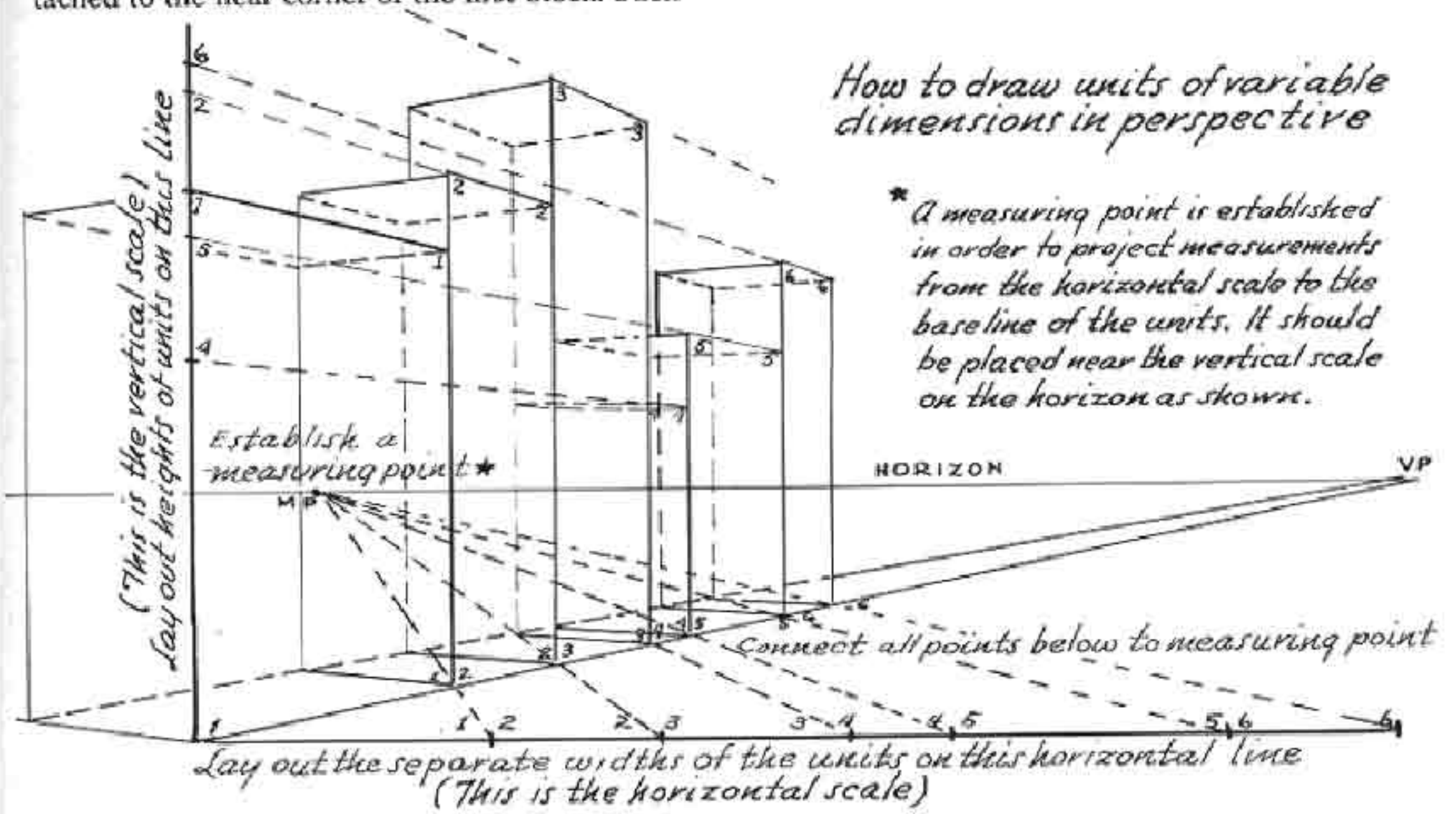


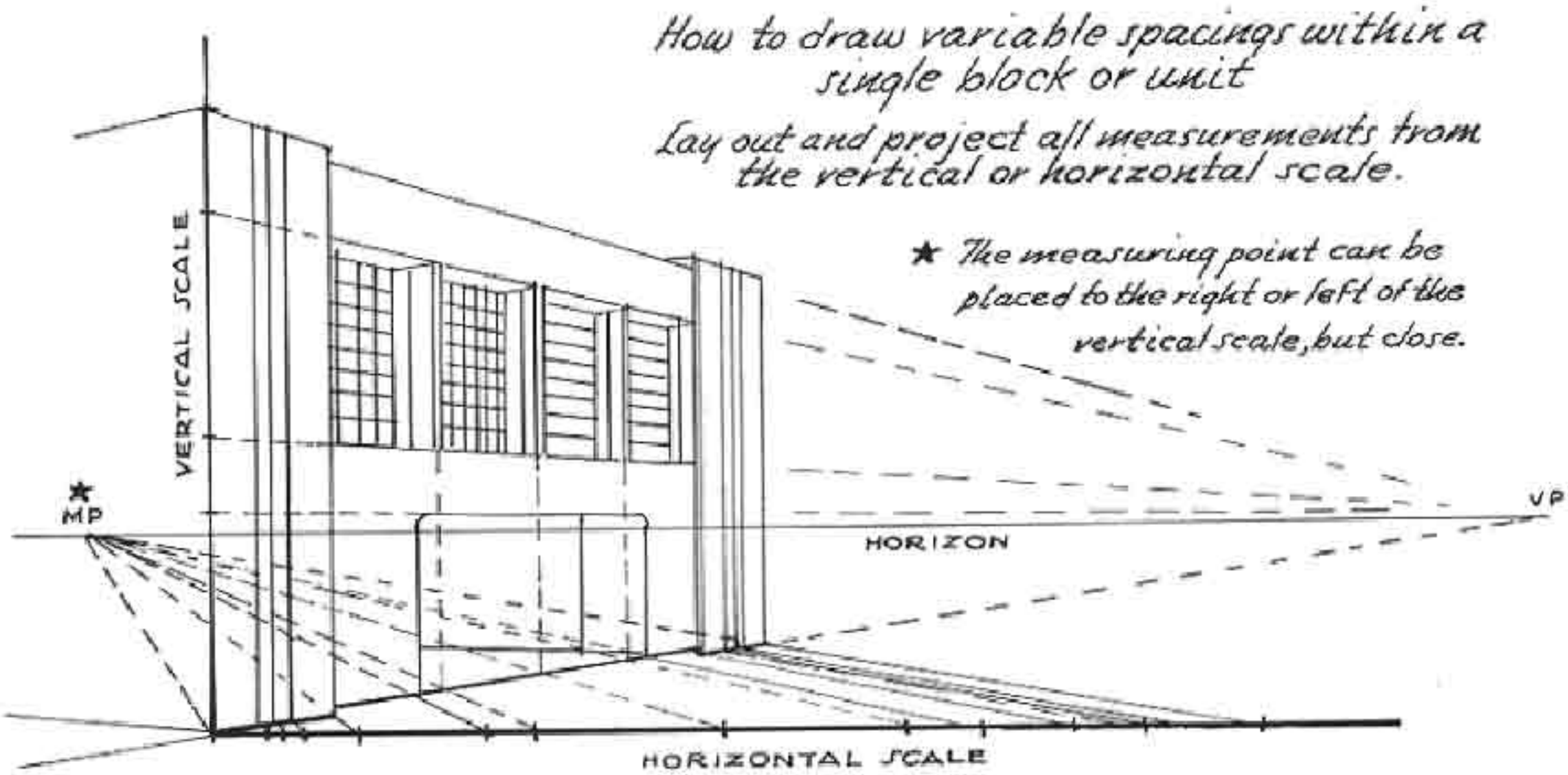
You may use the diagonals of the whole side (AAAA), or half of it (BBAA), producing the same result either way.

The diagonal of any side of the block may be used for repeating depth measurements. AB and CD are similar diagonals on parallel planes of equal size.

UNEQUAL SPACING OF SOLIDS IN PERSPECTIVE

Measurement of unequal depths in perspective becomes very simple if we use a vertical and a horizontal scale. The scale is a right angle attached to the near corner of the first block. Such an angle can be attached to any object, thus setting up a scale of measurement for all variable heights and widths.

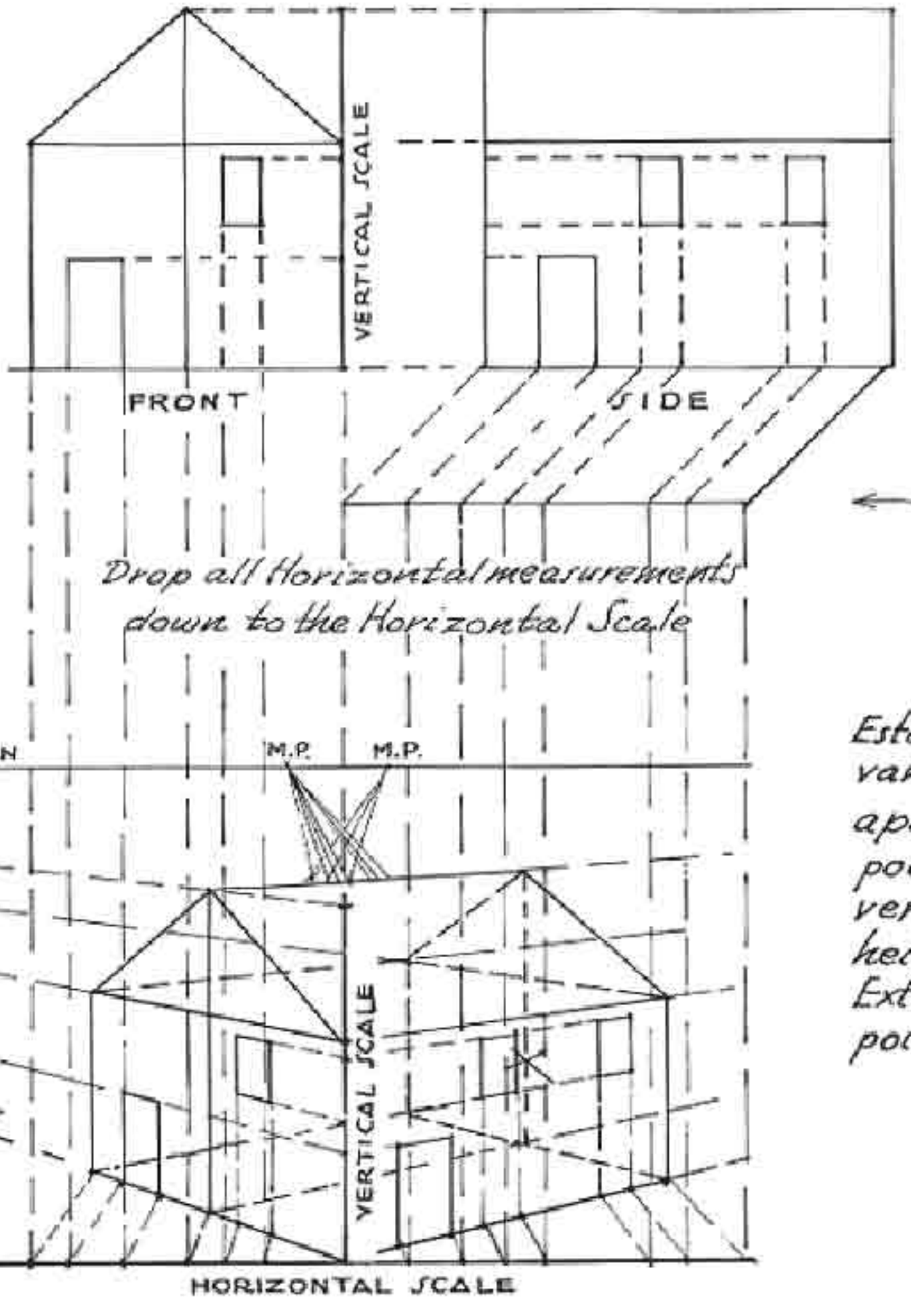




Measurements for all spaces may be set by choice or taken from a plan or scale elevation and laid out on the vertical and horizontal scale. They are then projected in perspective in the manner shown in this drawing.

SIMPLE PROJECTION IN PERSPECTIVE

Here is a very simple method of projecting dimensions and spacings in perspective. The top drawing shows the front and side elevations of a house. The dimensions of these create a vertical and a horizontal scale. The horizontal spacings are projected to the base lines by means of two measuring points. The vertical spacings are transferred to the vertical scale of the perspective drawing and projected to the vanishing points.



First draw the front and side elevations of a building of any dimensions or design, to a scale.

Bring the corners together with parallel lines.

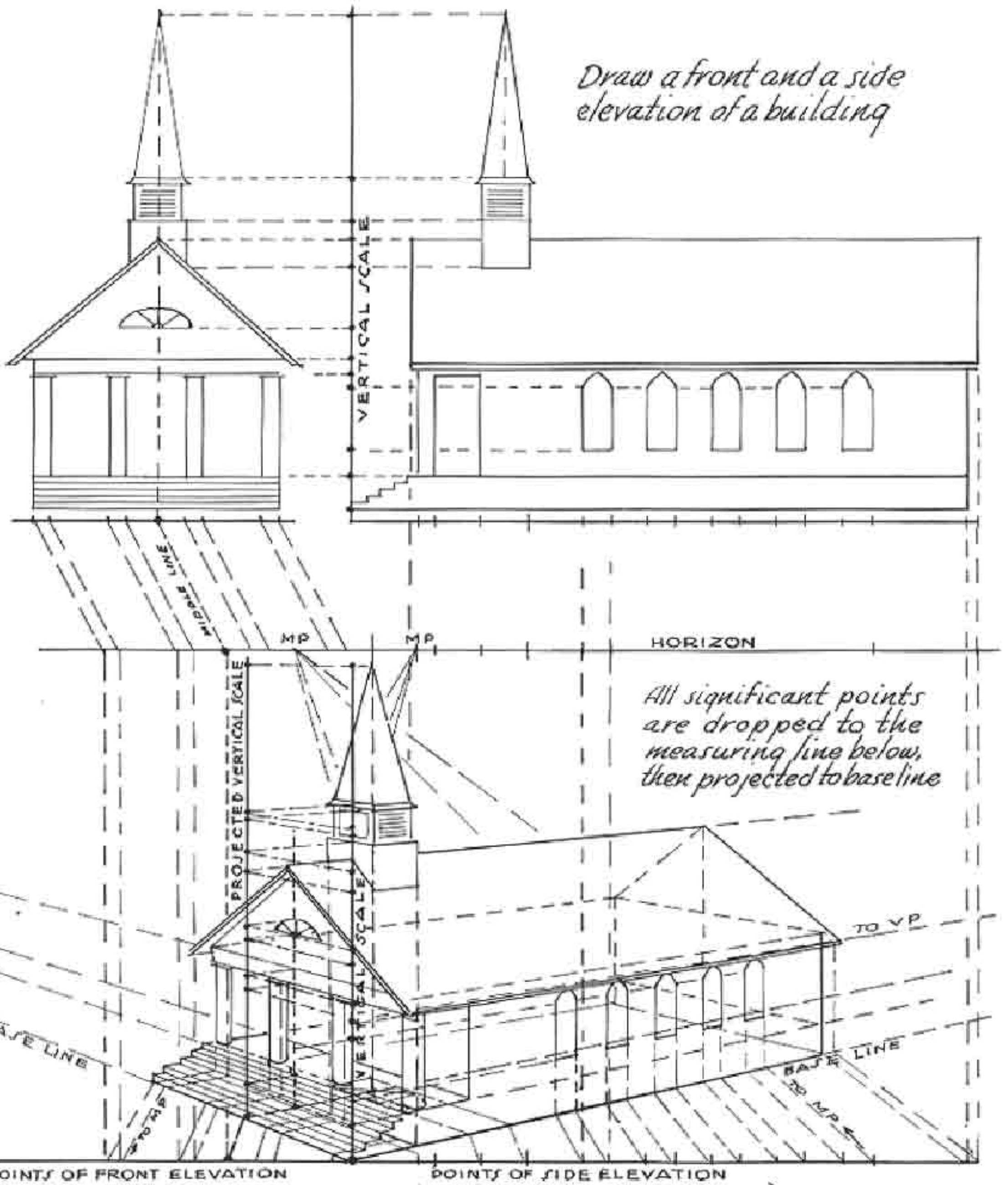
Drop all Horizontal measurements down to the Horizontal Scale

Establish a horizon with two vanishing points set well apart. Place a measuring point on each side of the vertical scale. Lay out the heights on the vertical scale. Extend base lines to vanishing points at both right and left.

The points on the horizontal scale are all connected to the two measuring points through the base lines. In this way the spacings are carried back to the building. Then by running perpendiculars up the walls at these points, we determine the lateral spacings in perspective. The points of the vertical scale are carried out to the vanishing points, thus establishing the vertical spacings on the perpendiculars brought up from the base lines.

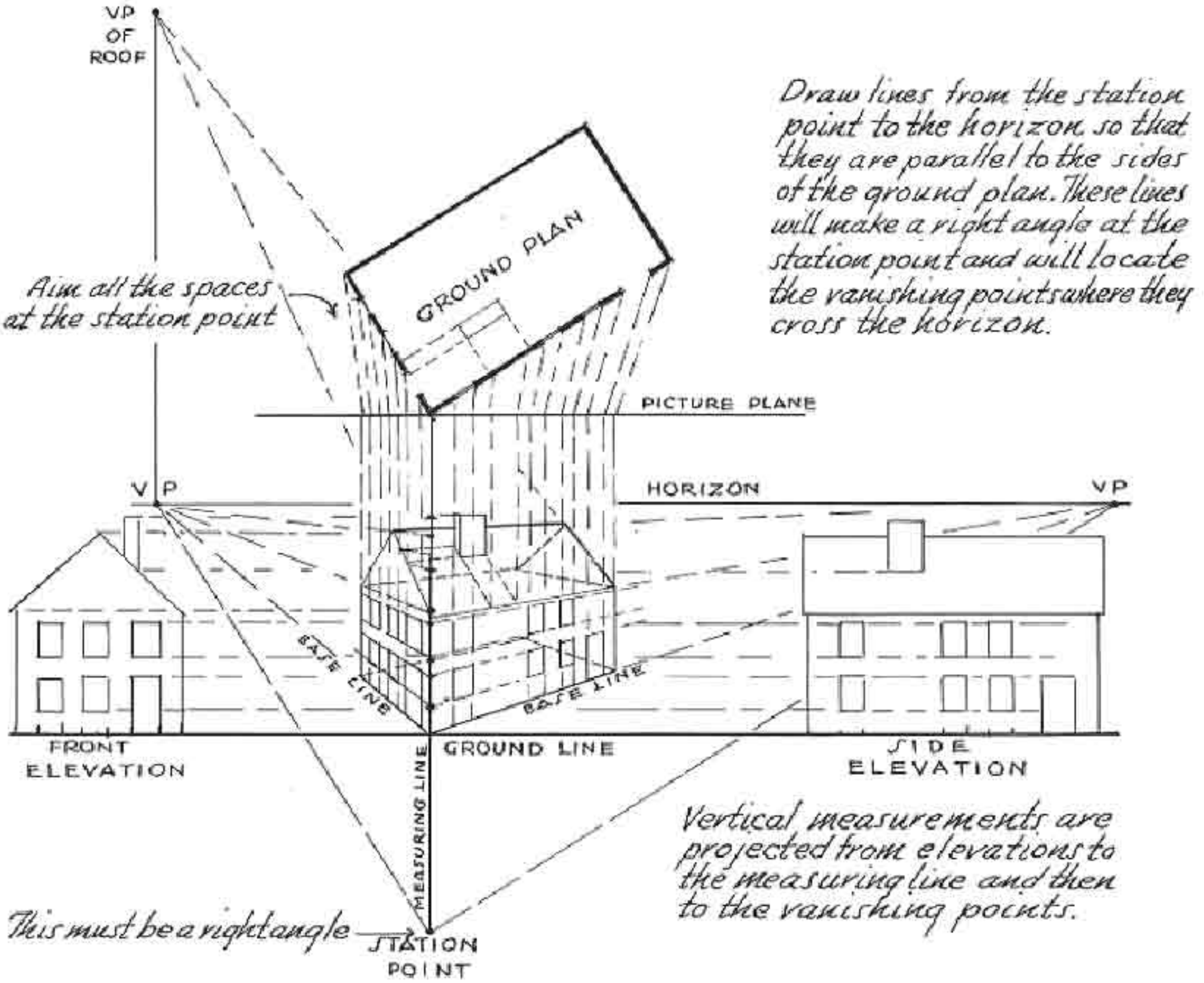
PROJECTING THE VERTICAL SCALE

The vertical scale can be projected to any part of a drawing. In the drawing below it is more practical to place the scale in front of the middle of the building, so we move it from the front corner of the steps, along the base line to the middle line, which has been projected down from the front elevation to the measuring line or horizontal scale.



ARCHITECTS' PERSPECTIVE

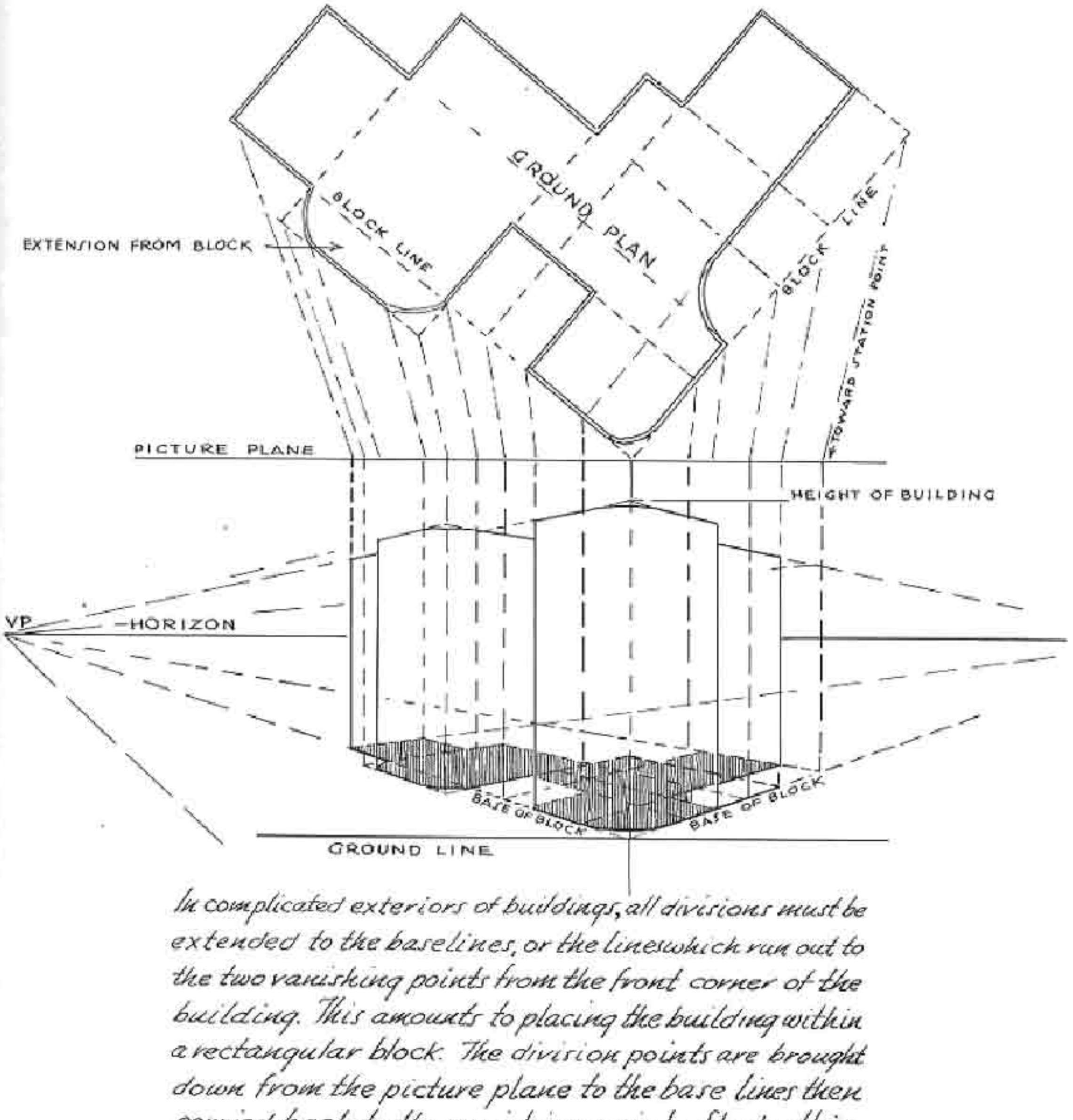
This is the way an architect renders ground plans and elevations in perspective. This knowledge makes it possible for an artist to draw any building to scale. Both vertical and horizontal spacing of units can be achieved with accuracy. Note that another point, called the "station point," has been employed here.



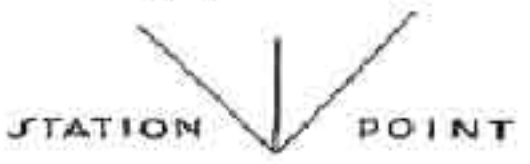
The station point represents the position of the observer. First we lay out a ground plan and place it at whatever angle we choose to view the building. We drop a vertical line down from the close corner. At this corner we also draw a horizontal line to represent the picture plane. A horizon can be established at any height above a ground line, both crossing the vertical. This vertical becomes a measuring line. Set a station point below the ground line. Lines aiming at the station point are drawn from the ground plan to the picture plane. All spacing is then projected to the base lines.

ARCHITECTS' PERSPECTIVE

In this drawing we have a rather complicated ground plan. But remembering that "any form can be built within a box," we make use of this truth to simplify the rendering in perspective of this odd shape. We are concerned here with setting the ground plan on the ground plane, using a single over-all height for the building.

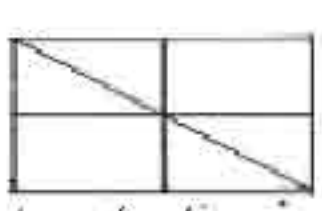


In complicated exteriors of buildings, all divisions must be extended to the baselines, or the lines which run out to the two vanishing points from the front corner of the building. This amounts to placing the building within a rectangular block. The division points are brought down from the picture plane to the base lines then carried back to the vanishing points. Study this.



SCALING YOUR PICTURE

This is an answer to perhaps the greatest puzzler in perspective drawing. By this method the base line of the picture may be set at any distance from the observer and an accurate scale set up in square feet, or other units, for the whole picture area. This gives both vertical and horizontal scaling.



Rectangles having a similar diagonal will equal each other.

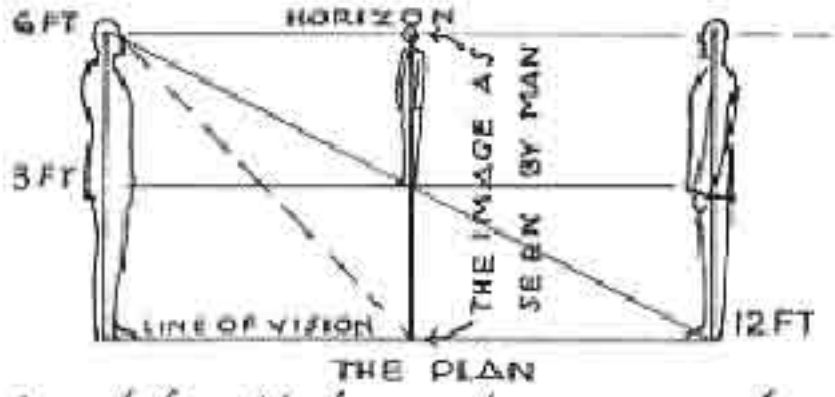
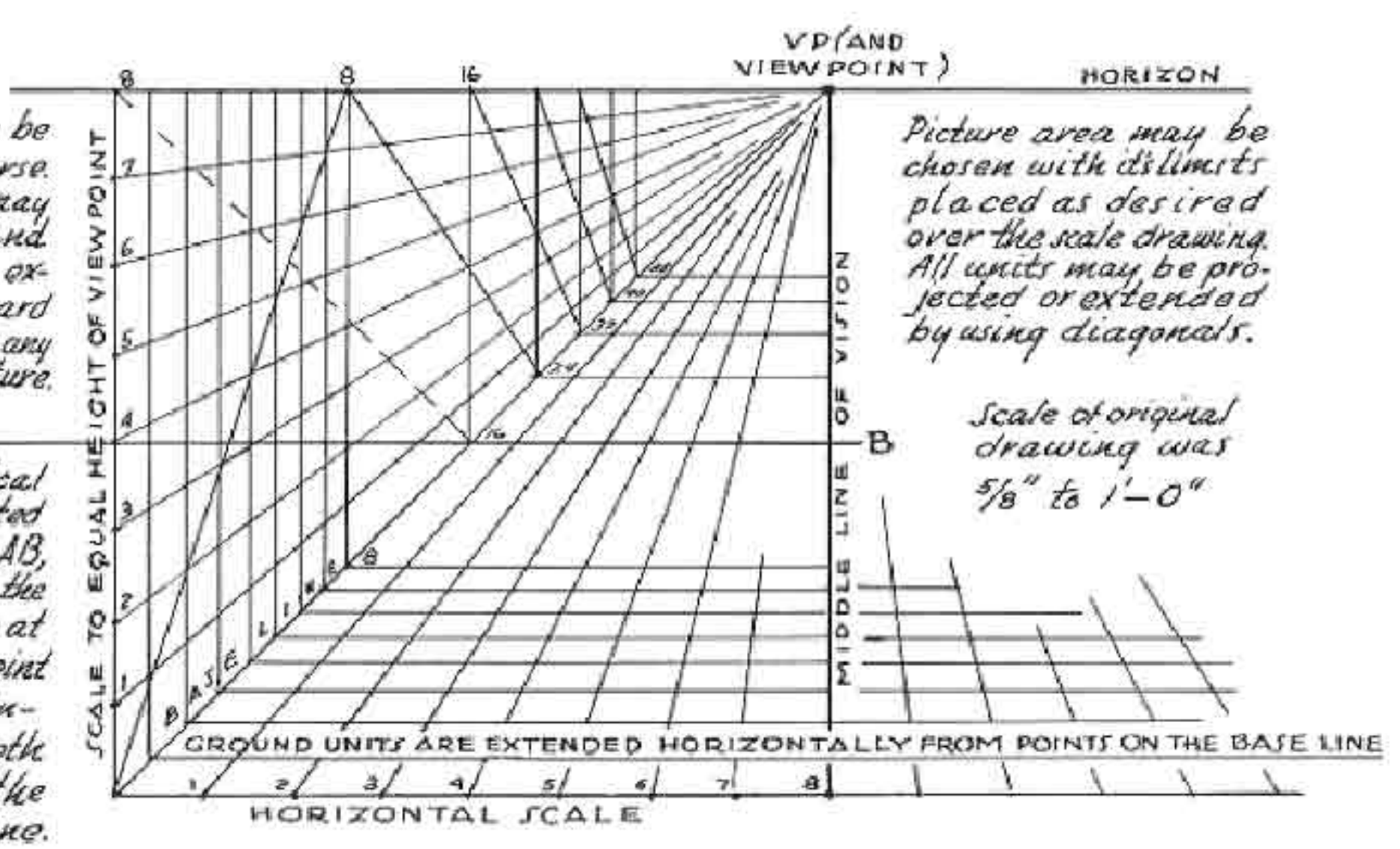


FIG. I

From the geometrical truth here shown, we learn that one half the picture area of the ground plane is taken up by a distance equal to twice the height of the viewpoint. Example: When viewing the horizon from a height of six feet (Fig. I), one half the vertical distance to the horizon will be taken up by the first twelve feet.

EXAMPLE OF SINGLE-POINT PERSPECTIVE SCALING

SHOWING A GROUND PLANE VIEWED FROM A HEIGHT OF EIGHT FEET



Drawing may be done in reverse. Ground plan may be widened and vertical plane extended upward or projected to any part of the picture.

Since the vertical height selected is 8 ft., the line AB, which crosses the vertical scale at the halfway point of 4 ft., will indicate a depth of 16 ft. on the ground plane.

Picture area may be chosen with its limits placed as desired over the scale drawing. All units may be projected or extended by using diagonals.

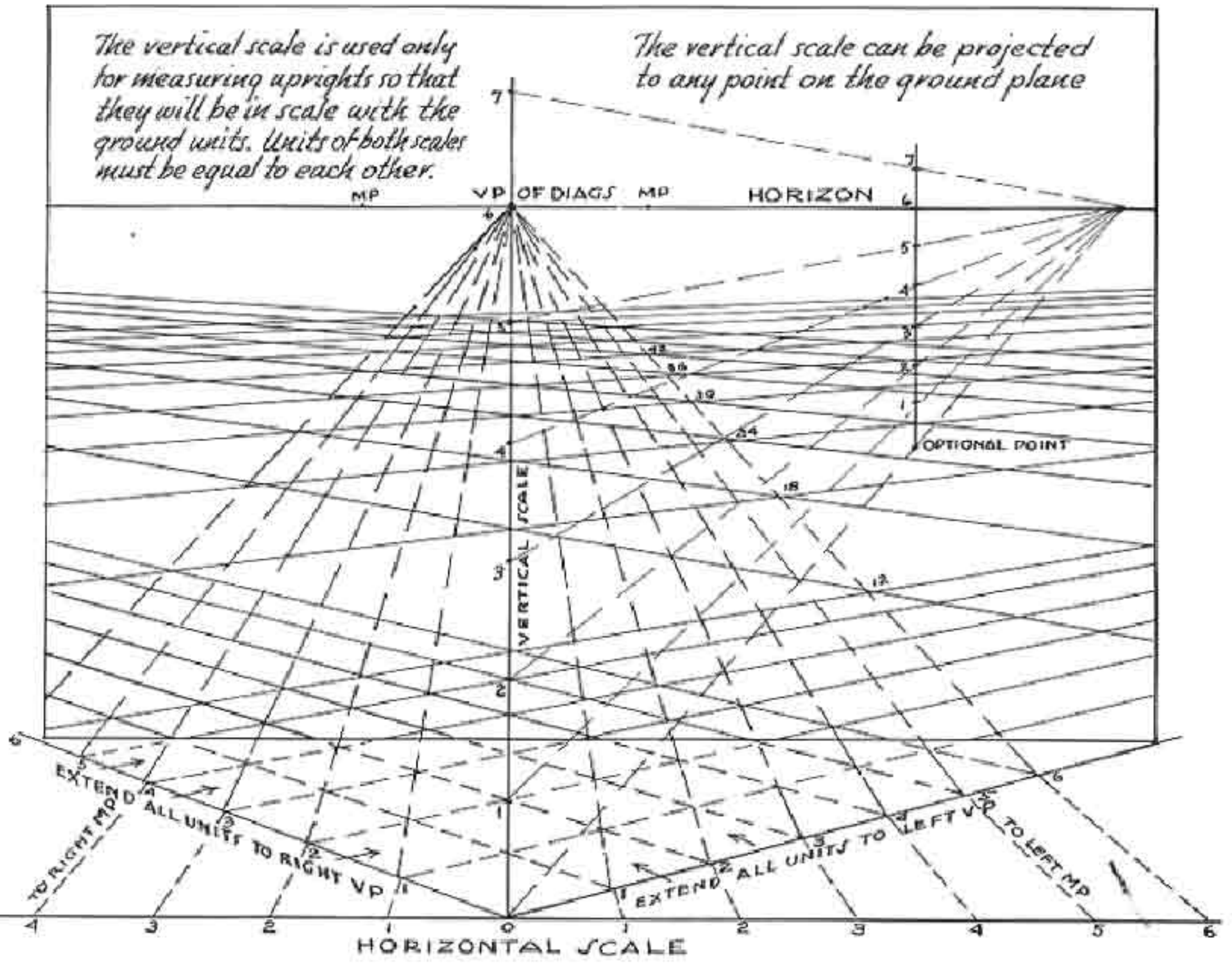
Scale of original drawing was 5/8" to 1'-0"

Select height for a viewpoint. Establish a horizon through the viewpoint. Construct a horizontal and a vertical scale, both equal to the height of viewpoint. These, with the horizon, will complete a square. Mark off feet units on both scales. Draw the horizontal AB through the halfway point of vertical scale. Connect all units to the vanishing point (in this case, the viewpoint). Erect perpendicular where line AB crosses base line. Reduce areas to square feet by using diagonals.

SCALING YOUR PICTURE

Scaling the ground plane for two-point perspective requires the usual two vanishing points set wide apart. The horizontal scale is set on or below the bottom line of the picture. The vertical scale is practical when placed at the near corner of the first square. The horizon can be set at any height you choose.

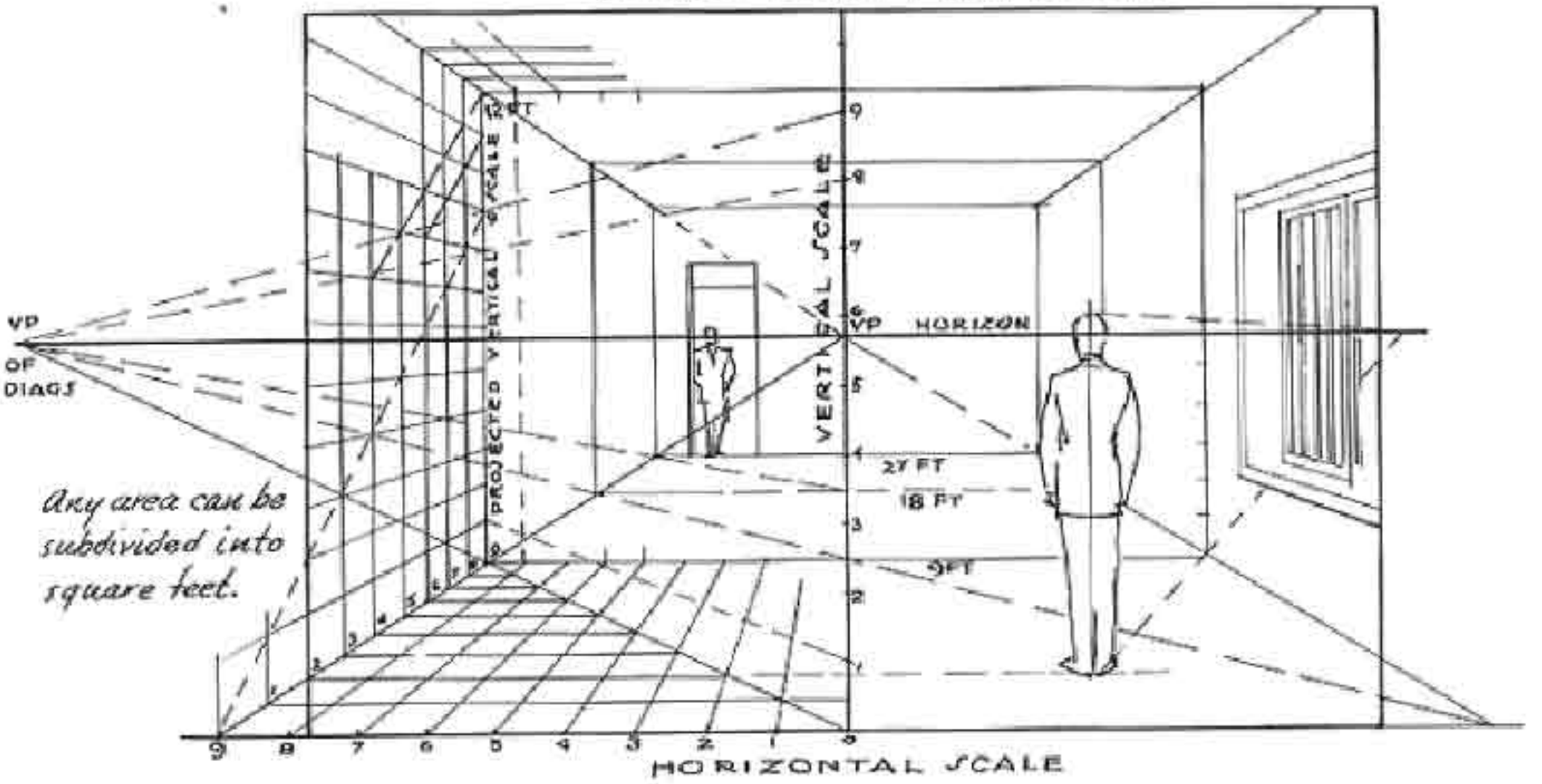
TWO-POINT PERSPECTIVE



Establish two measuring points, one on each side of the vertical scale, evenly spaced on the horizon, (MP). From point zero establish base lines to both vanishing points. Connect horizontal scale units to reach baselines on both sides by lines pointing at MP's. This marks off units in perspective on both base lines Extend these units to both vanishing points. After you have established some squares, you can locate the vanishing point of the diagonals on the horizon. More squares will be marked off as the diagonals cross unit lines to the vanishing points.

SCALING THE INSIDE PLANES OF THE BLOCK

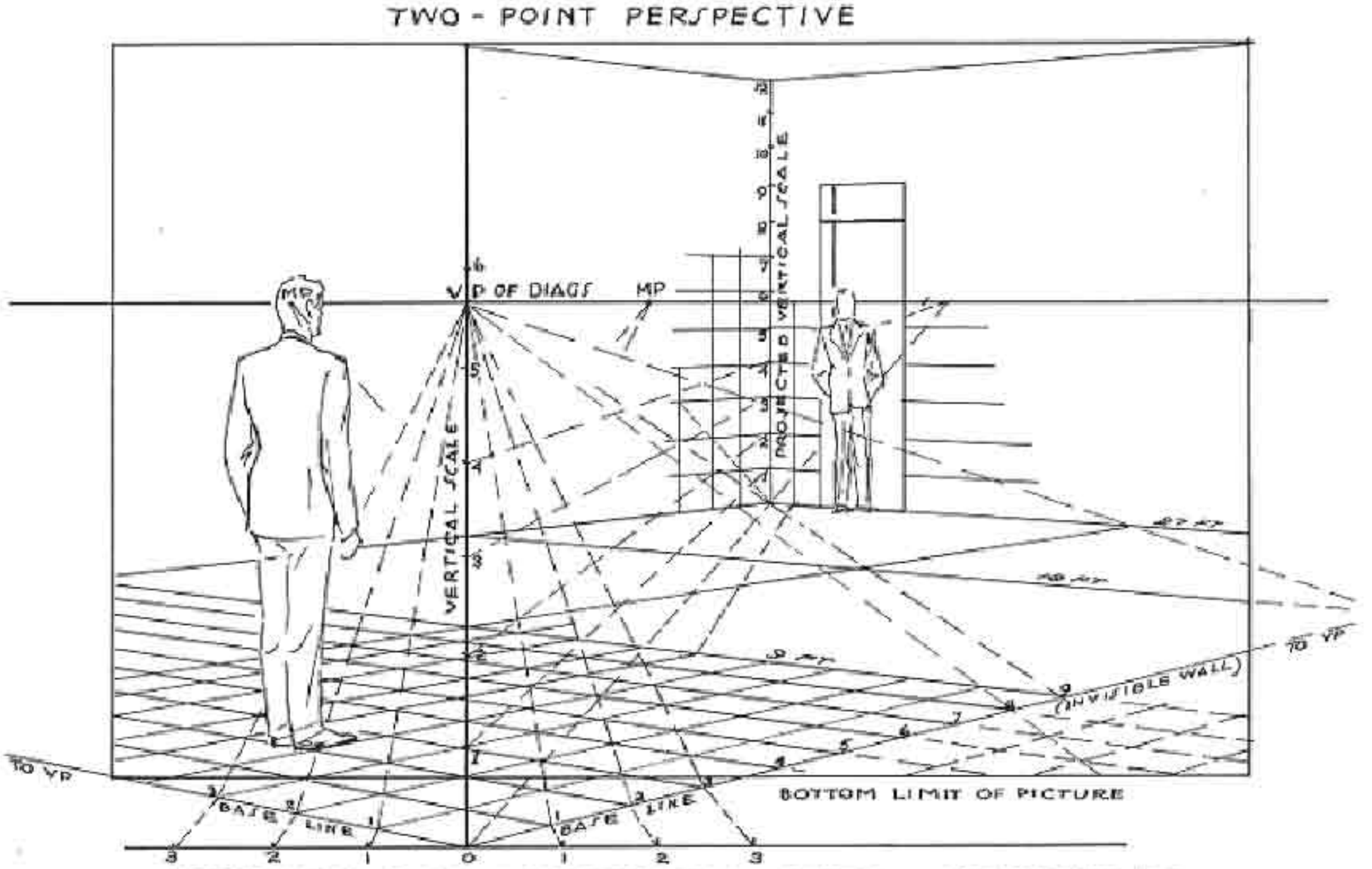
The vertical and horizontal scales can be used to scale any plane. Once we have the unit lines running in one direction, the diagonal of any square in crossing these lines marks off the units running in the other direction, for width or depth as the case may be. All diagonals of similar squares or units will have the same vanishing point.



In the drawing above the following problem is worked out. Draw a room 18 by 27 by 12 ft. at normal eyelevel, with two figures standing 25 ft. apart, in single-point perspective. Solution: Establish a vertical scale on a horizontal scale. Mark these off in foot units to be equal on both scales. Set the horizon at slightly less than 6 vertical feet. Set vanishing point at intersection of horizon and vertical scale. Connect horizontal units to VP. Establish depth of first square foot. Draw diagonal to horizon. This establishes VP of the diagonals for all receding units and also creates a unit 9 by 9 ft. Repeat this unit with diagonals as shown.

SCALING THE INSIDE PLANES OF THE BLOCK

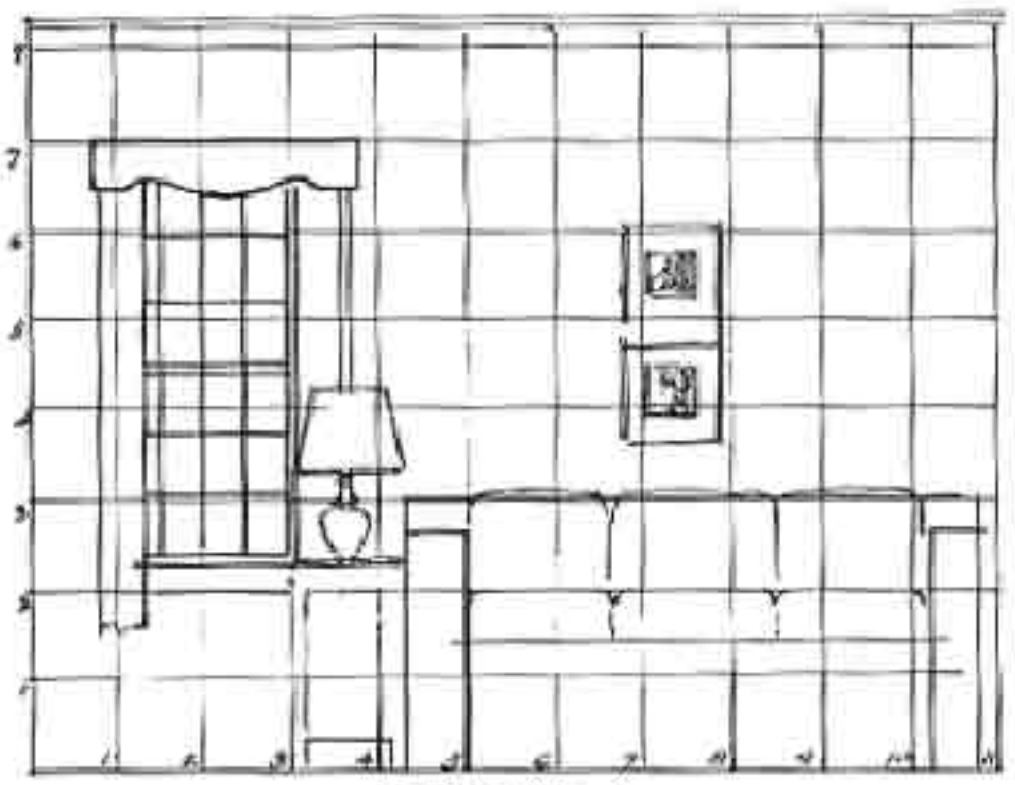
Here the previous problem has been changed to two-point perspective. This amounts to a change of viewpoint. Instead of looking straight down the middle of the room, the observer has moved to a theoretical position to the right of the figures. Only two walls are now visible. The full length of the room cannot be shown.



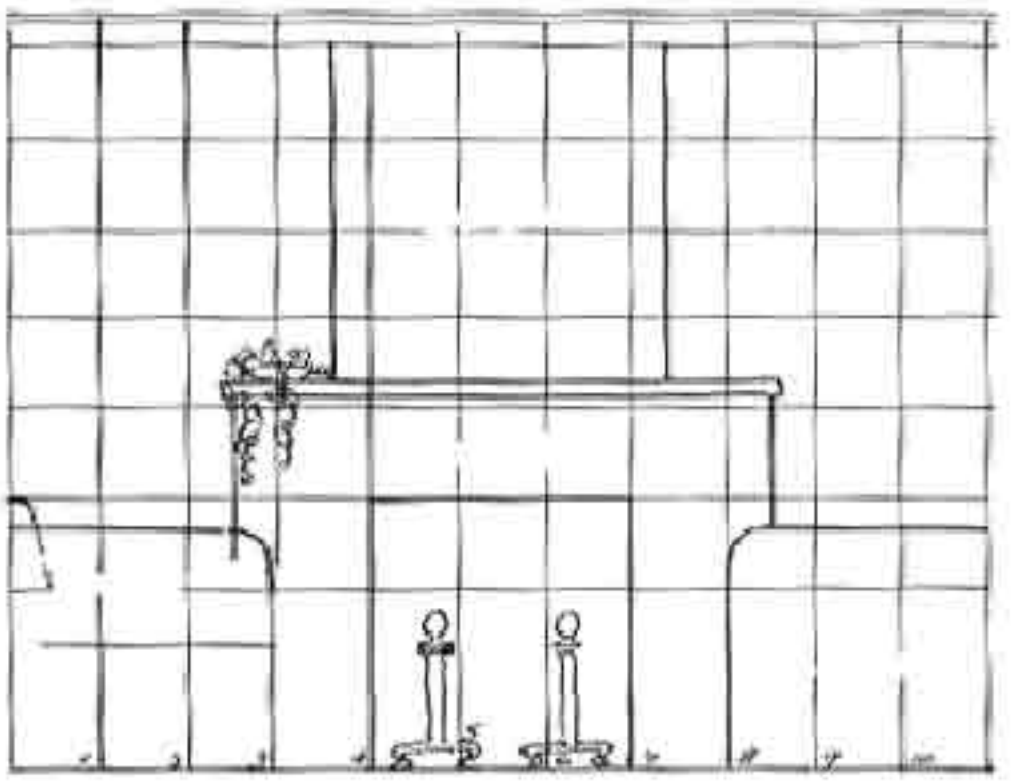
The squaring off of the ground plane, in the drawing above, is made simpler by establishing two measuring points, one to the left and one to the right of the vertical scale. The near corner of the room is dropped below the bottom limit of the picture. Units on the horizontal scale are projected up to the base lines of the floor by connecting them to the two measuring points. By the use of diagonals, we can mark off remaining units.

SCALING AN INTERIOR FROM ELEVATIONS

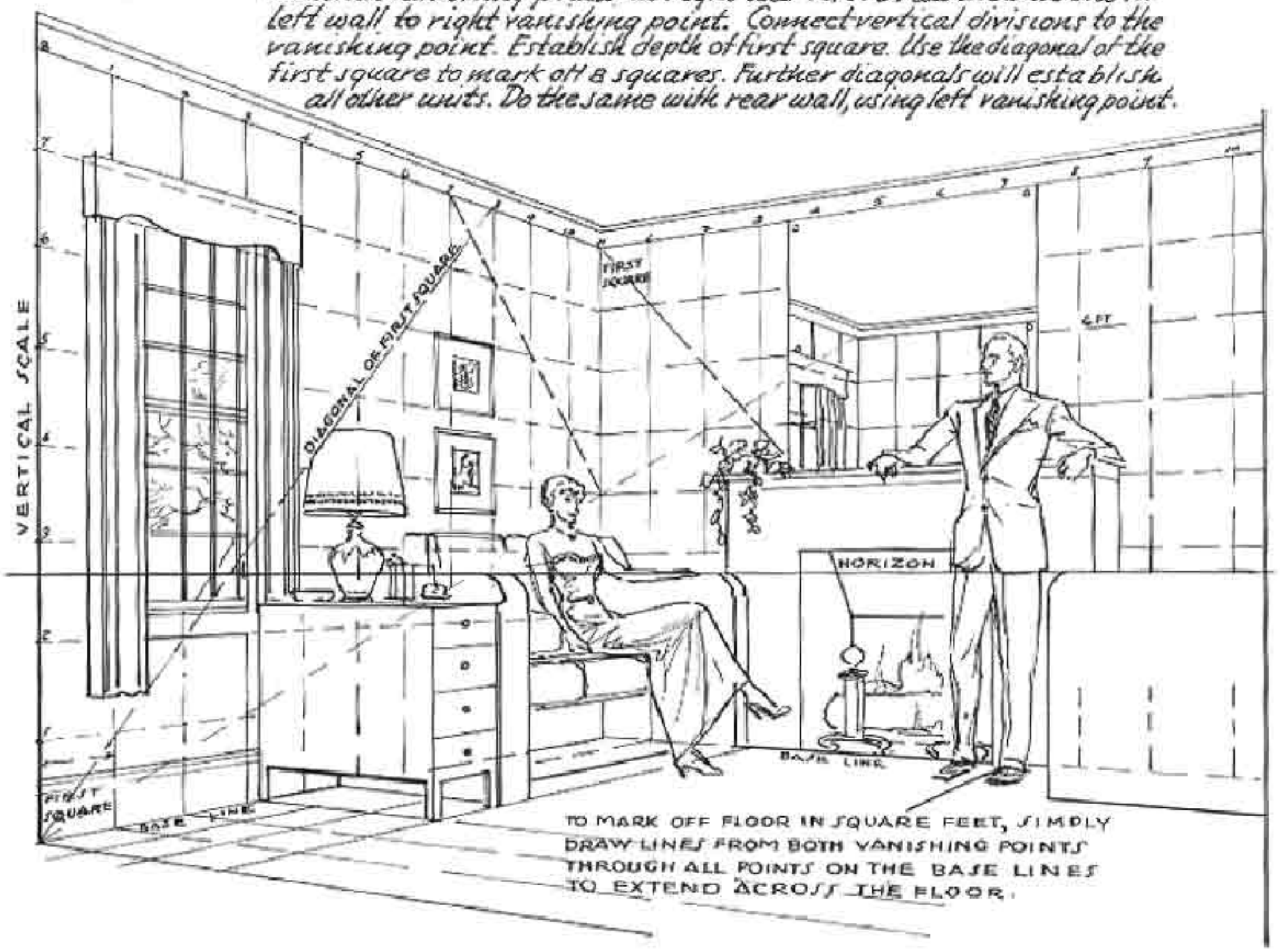
The importance of being able to scale inside walls and floors should be obvious to anyone interested in good drawing. When you can do this, you can draw any interior and any furnishings within an interior, keeping all things in scale or proportion to each other, and you know what size a figure should be at any spot in the room.



SIDE WALL



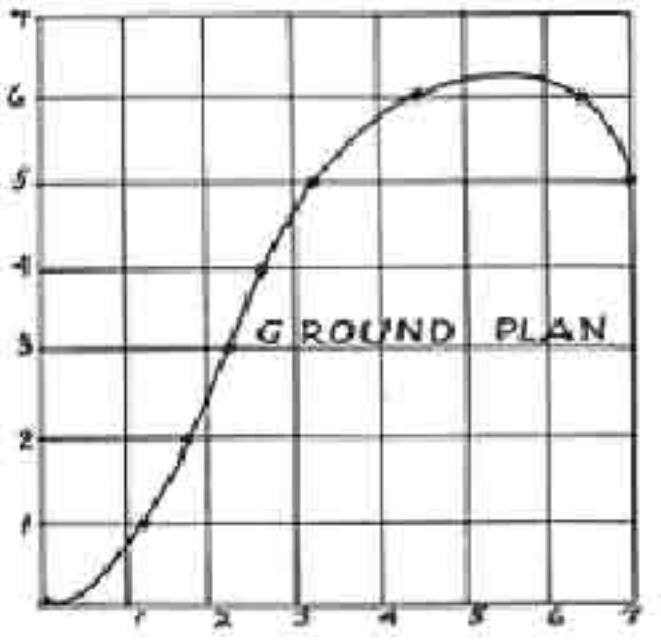
REAR WALL

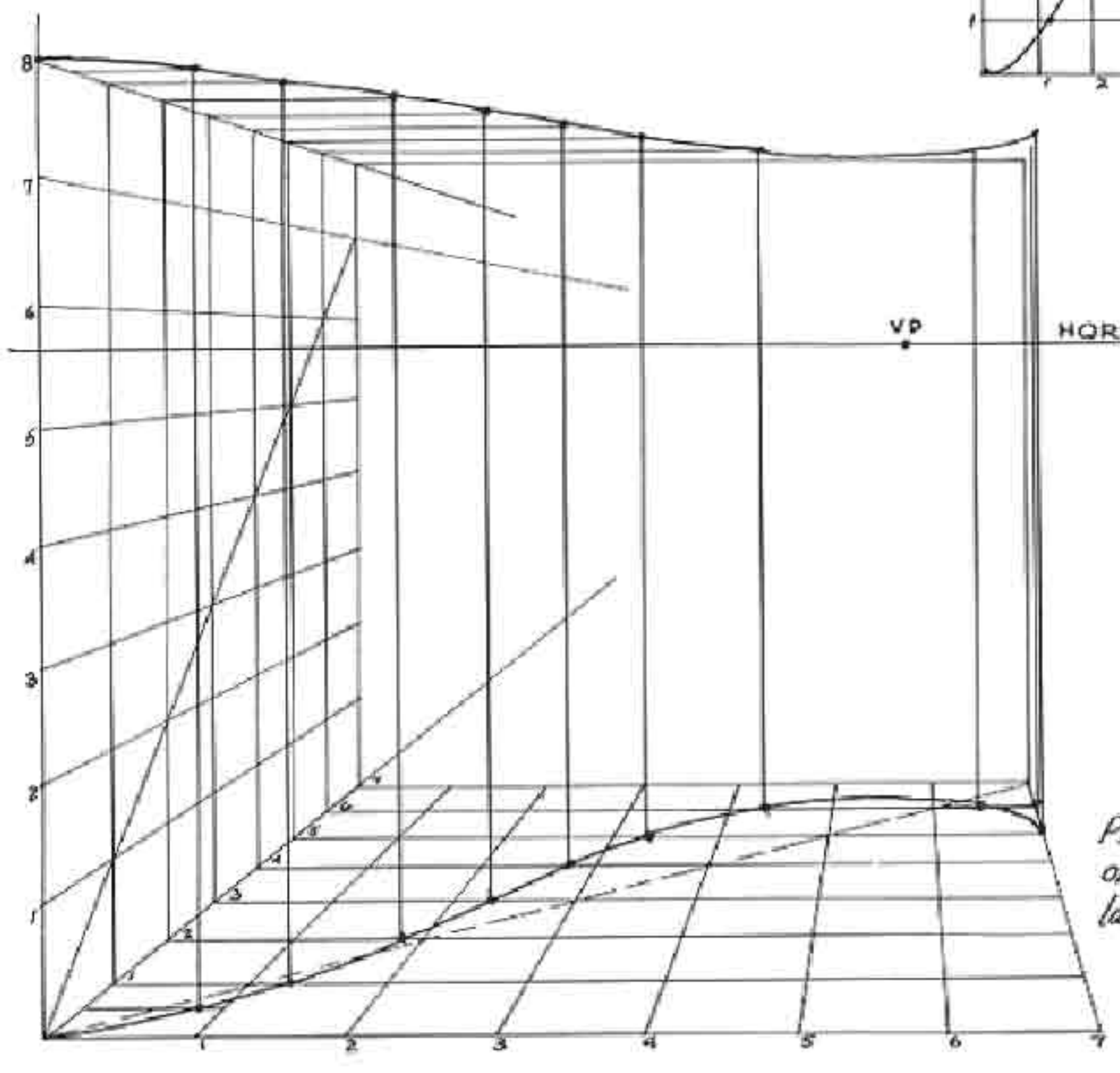


HOW TO DRAW A CURVED SURFACE IN PERSPECTIVE

The problem of drawing a curved surface in correct perspective is often puzzling. A simple solution is offered below. A ground plan is made, which can be scaled off in units, from which the curve can then be put into perspective.

Lay out a plan of the curve. Block it off in square units. Mark a point wherever the curve crosses the horizontals.



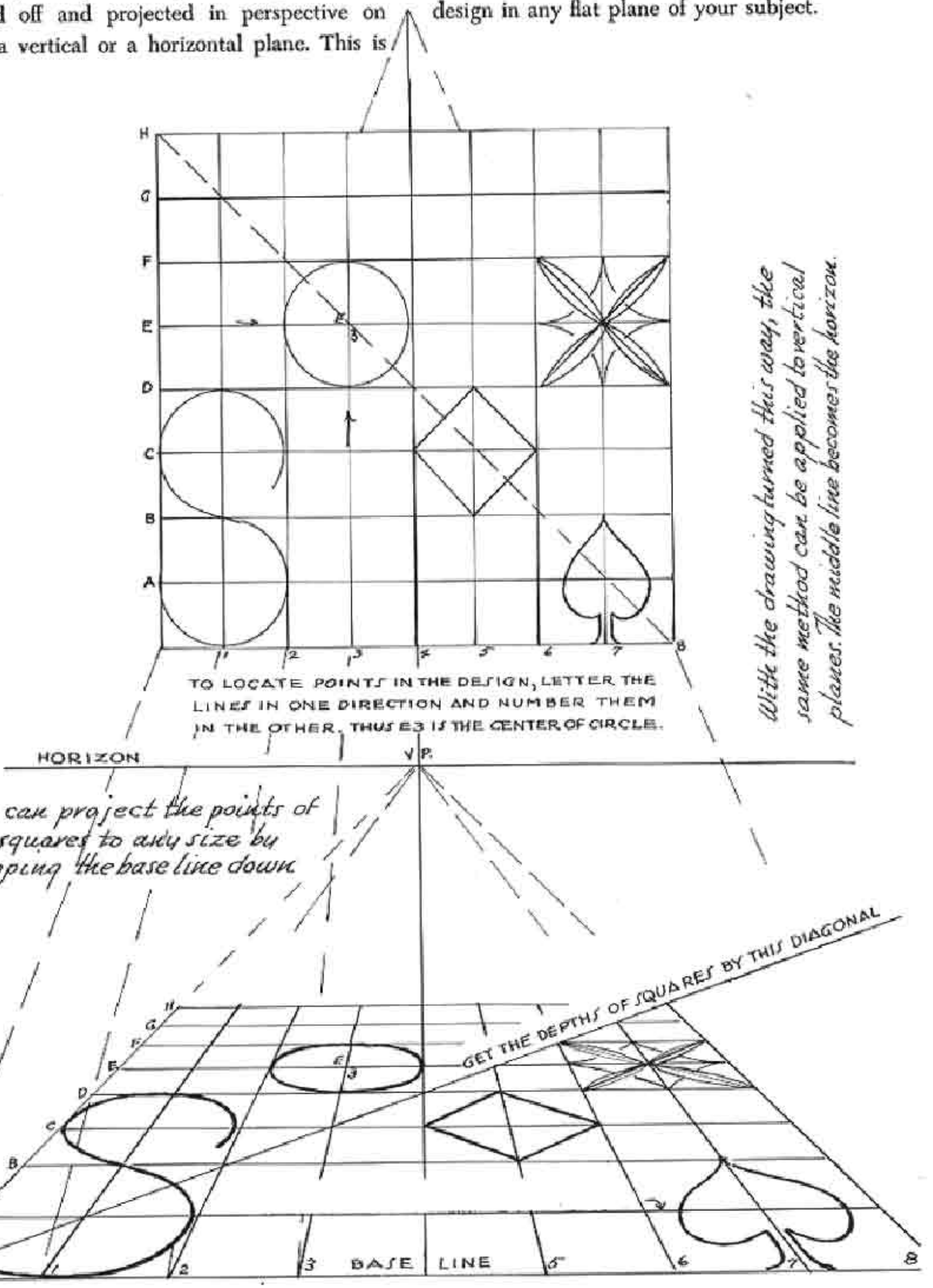


Place similar points on the ground plan laid out in perspective.

We set the plan on the ground plane in the usual manner, in either single or two-point perspective. We establish a scale of height at the close end of the plane. Vertical units are then squared off to form a straight wall at one side of the ground plan. Erect a perpendicular at every point where the curve crosses a horizontal division of the ground units. Draw a horizontal out to meet each perpendicular from the top of the side wall. This establishes the height of the curved plane at that point. Units may be bisected when necessary as shown in the first unit above.

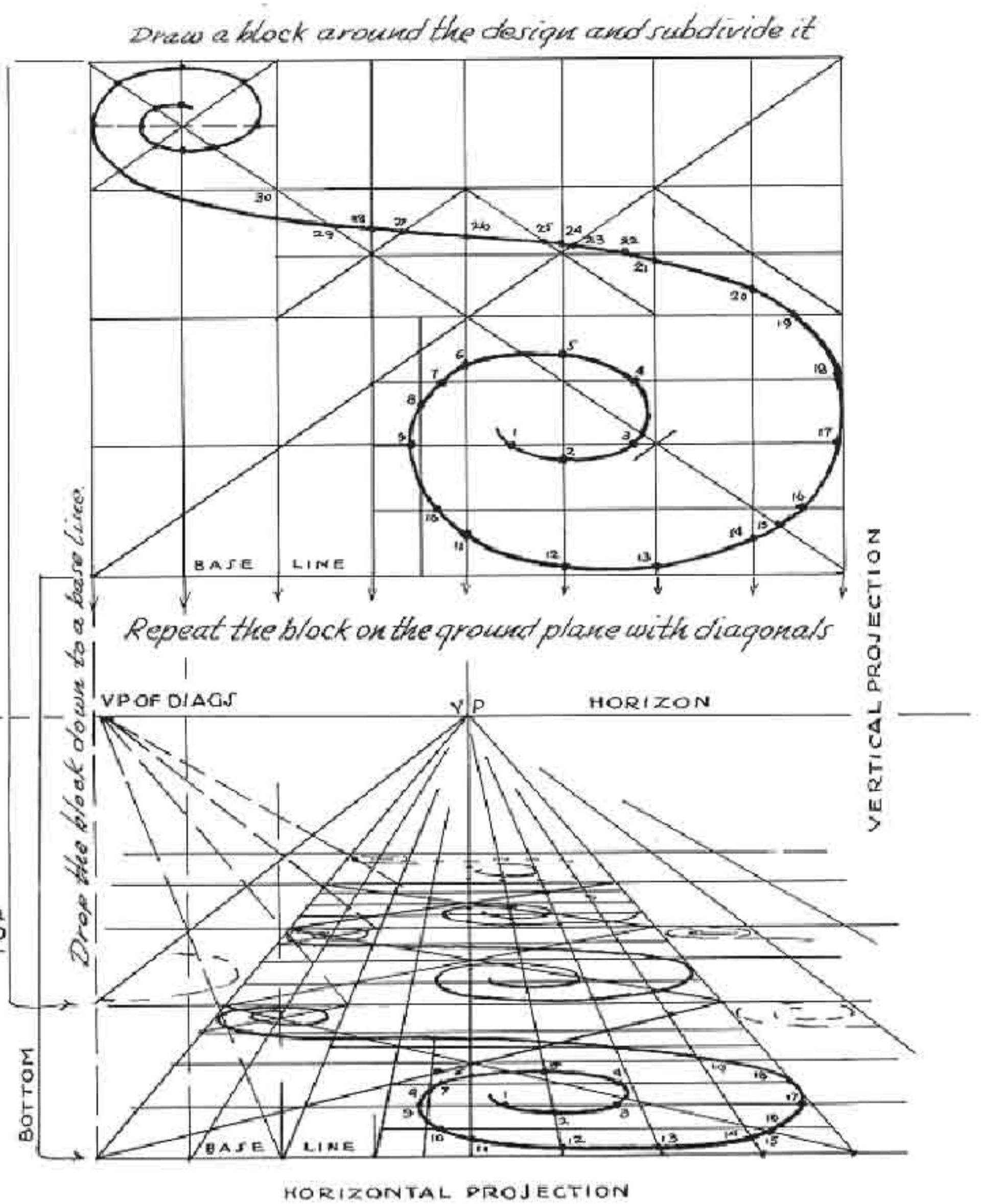
SIMPLE PROJECTION

This is a simple but very valuable bit of working knowledge. Any drawing or design can be squared off and projected in perspective on either a vertical or a horizontal plane. This is practical for such things as lettering in perspective, wall and floor designs, or placement of any design in any flat plane of your subject.



REPEATING A DESIGN IN PERSPECTIVE

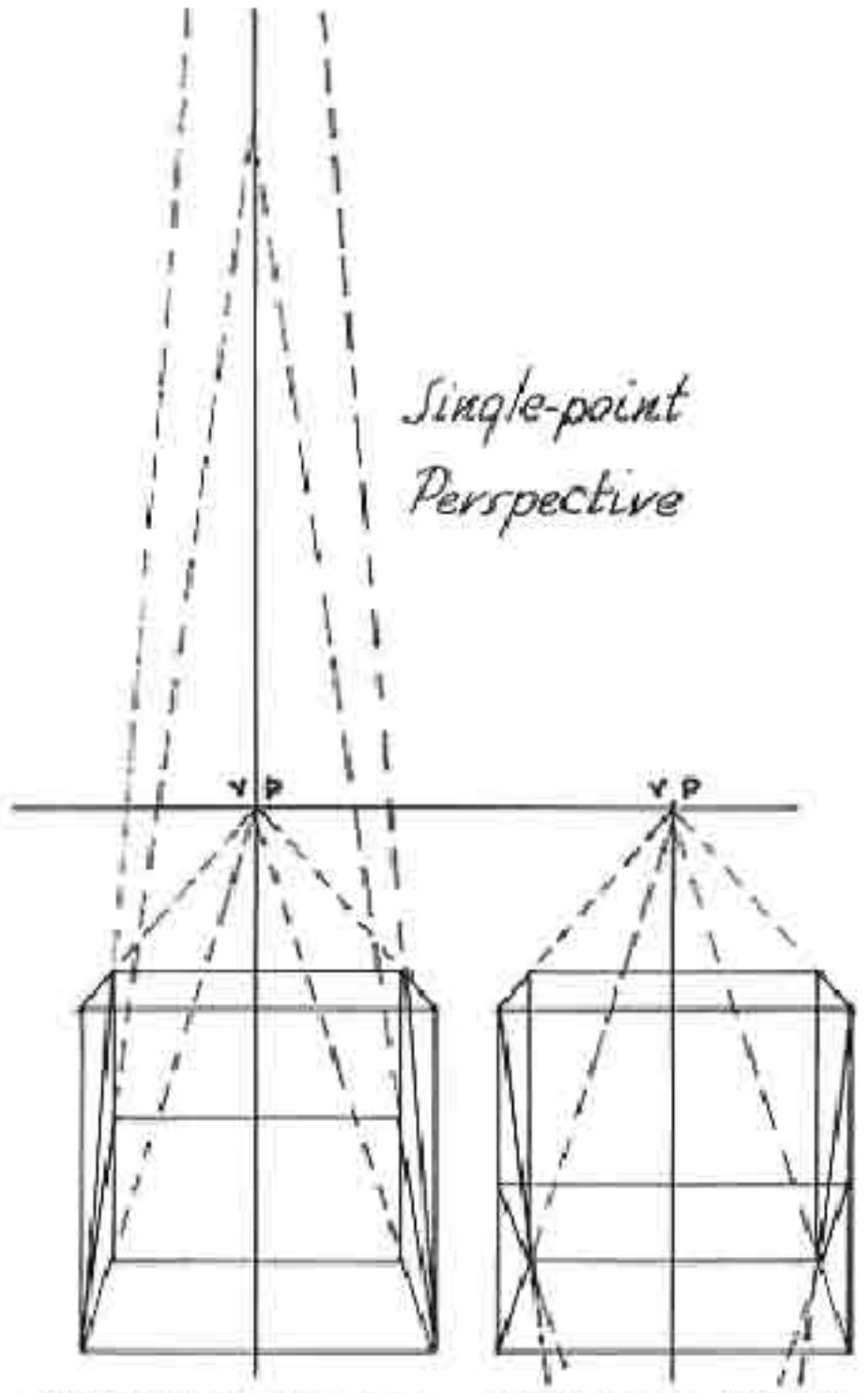
Any design can be repeated in perspective. Simply square off the design. The squares serve as guide lines for the points to be followed. By laying out such points on the squares, you can readily approximate the position of the points on the divided rectangle in perspective. Draw diagonals to repeat the blocks.

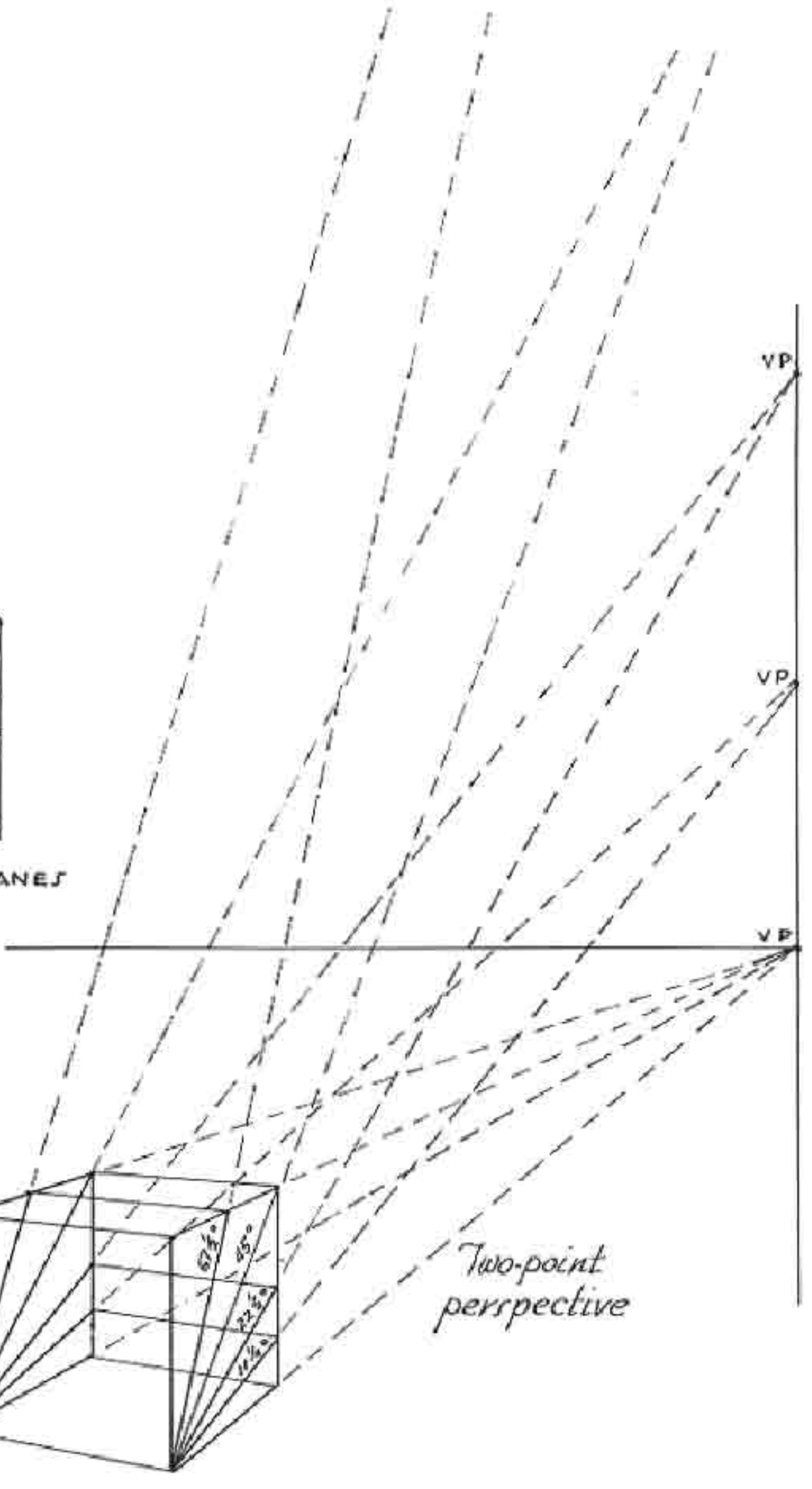


Lay out points wherever the design crosses the division lines of the block. Lay out similar points on the division lines of the block in perspective as shown below.

INCLINED PLANES IN PERSPECTIVE

The ground plane is always considered as a level plane stretching out to the horizon. All other level planes, or planes parallel to the ground plane, have their vanishing points on that horizon. Inclined planes vanish above or below the horizon.

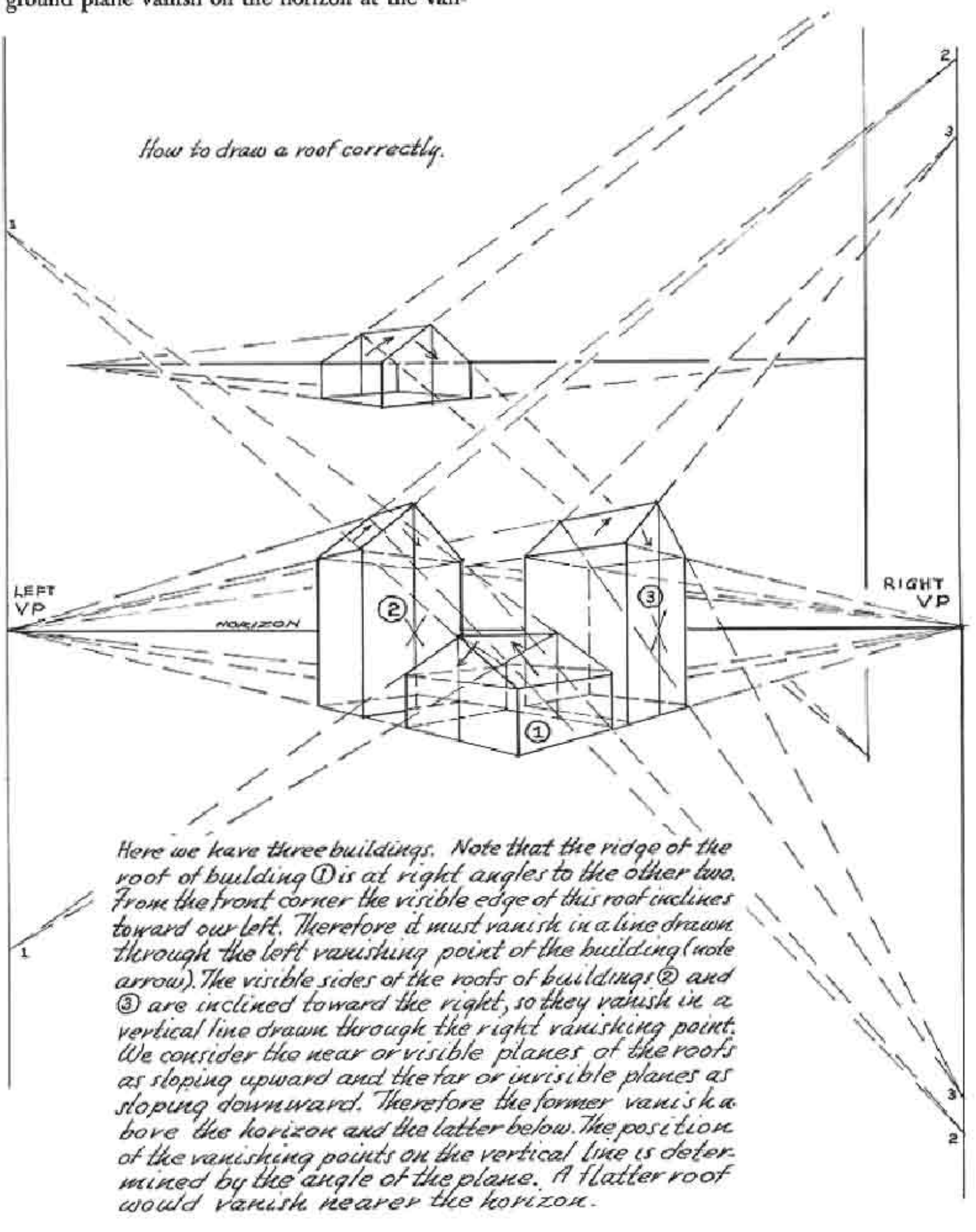




The vanishing points of inclined planes do not fall on the horizon of the ground plane, but on a vertical line through a vanishing point of a horizontal plane. The vanishing point of an ascending plane will be above the horizon, that of a descending plane is below the horizon.

INCLINED PLANES IN PERSPECTIVE

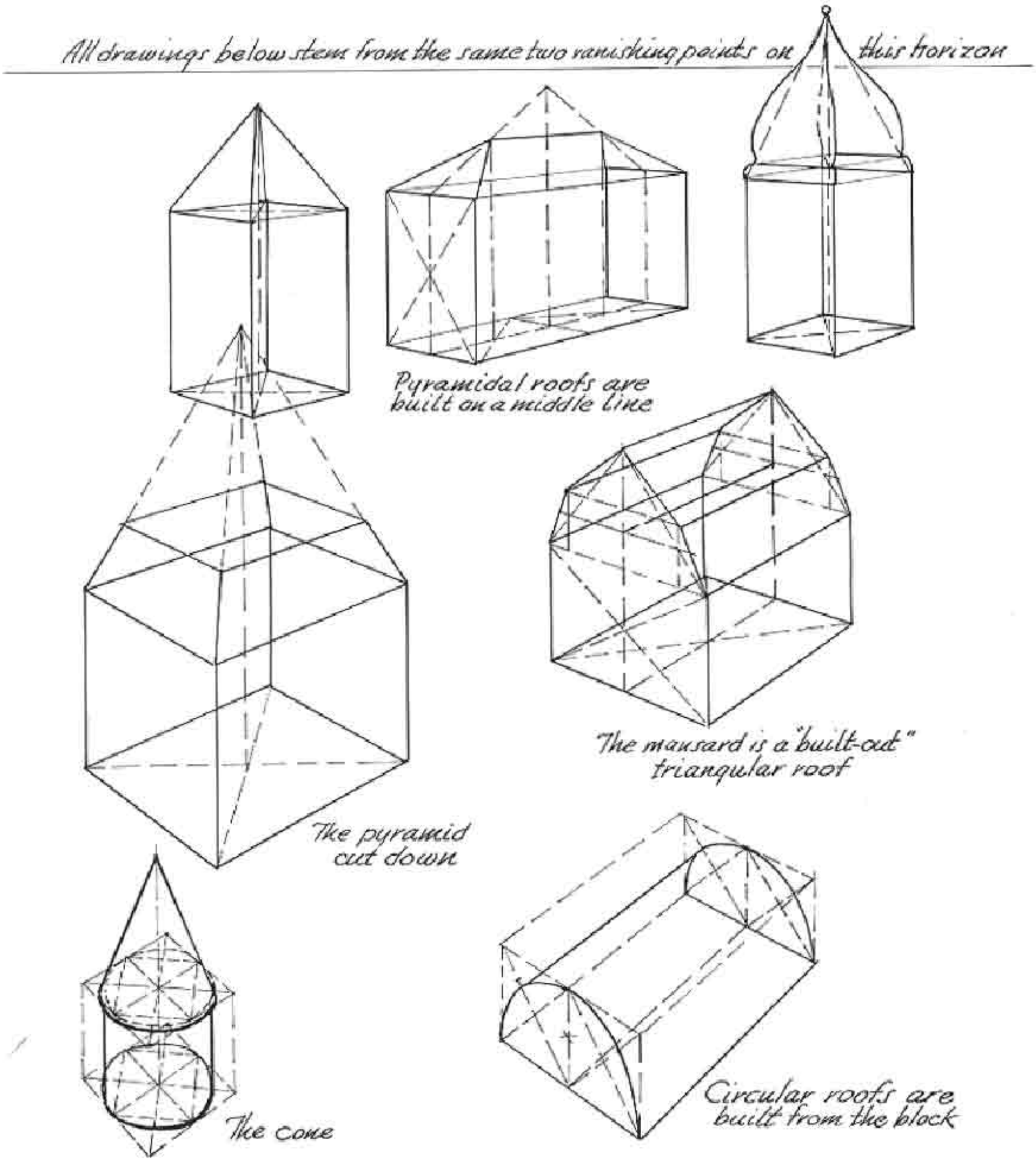
Drawing roofs is a problem to one who does not know perspective. A roof, being an inclined plane with two edges parallel to the ground, has two vanishing points. The edges parallel to the ground plane vanish on the horizon at the vanishing point of the building. The inclined edges vanish above or below the horizon on a vertical line drawn through the vanishing point of the building. Many artists do not know this.



Here we have three buildings. Note that the ridge of the roof of building ① is at right angles to the other two. From the front corner the visible edge of this roof inclines toward our left. Therefore it must vanish in a line drawn through the left vanishing point of the building (note arrow). The visible sides of the roofs of buildings ② and ③ are inclined toward the right, so they vanish in a vertical line drawn through the right vanishing point. We consider the near or visible planes of the roofs as sloping upward and the far or invisible planes as sloping downward. Therefore the former vanish above the horizon and the latter below. The position of the vanishing points on the vertical line is determined by the angle of the plane. A flatter roof would vanish nearer the horizon.

INCLINED PLANES IN PERSPECTIVE

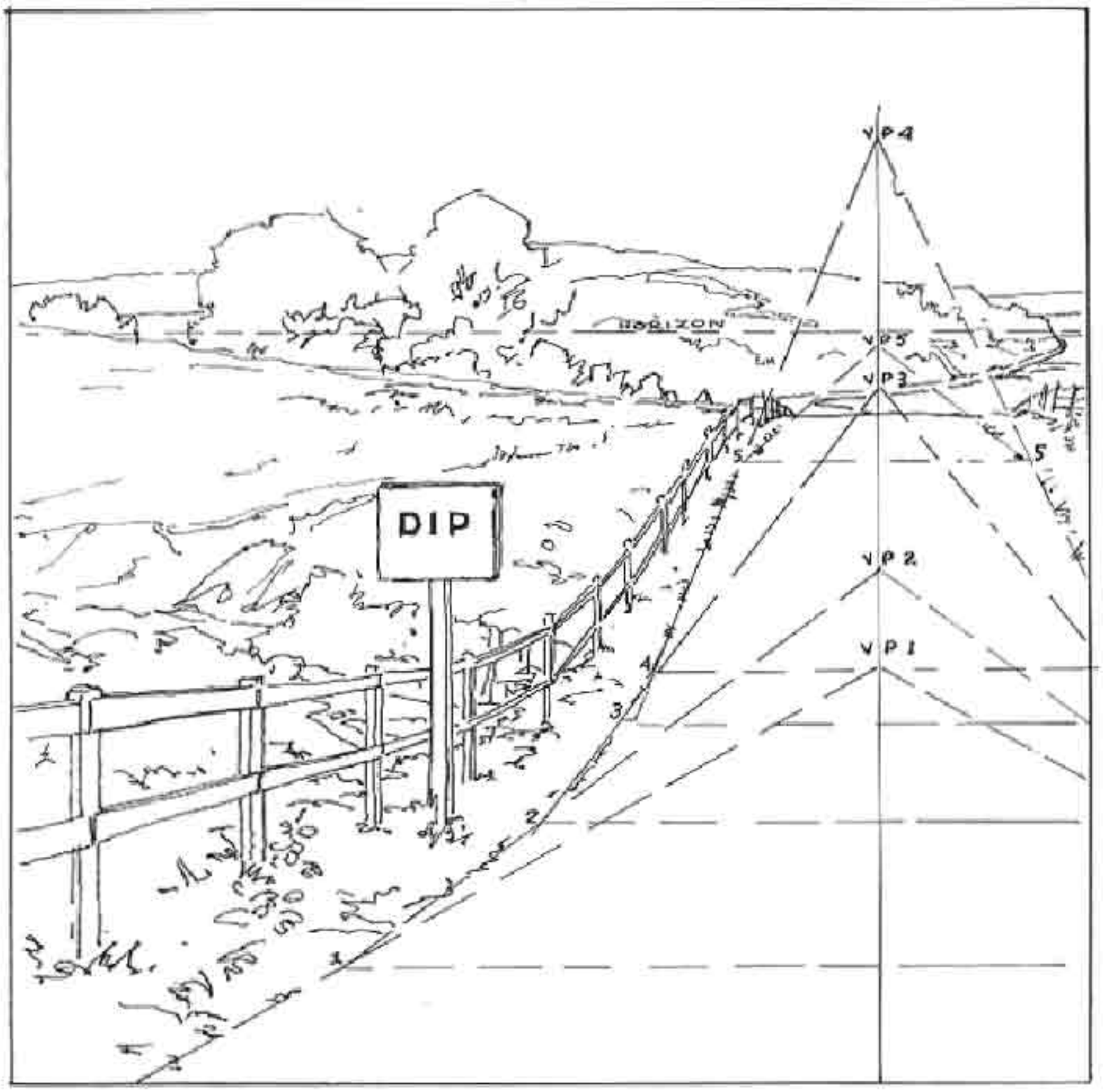
The pyramid and similar forms are exceptions to the general rule, in that they have no vanishing points except those for the base lines. A conical form has no vanishing points except those for the block inside which the form is constructed. We must always build such forms from a block in correct perspective, since there is no other way to relate them to the horizon.



INCLINED PLANES IN PERSPECTIVE

We must understand that inclined planes do not vanish at the eye level or on the picture horizon. The horizon has only to do with level planes and planes with edges parallel to the level ground plane. This is confusing to the average student. Ascending planes always vanish above the horizon. Descending planes always vanish below the horizon. Try to remember this.

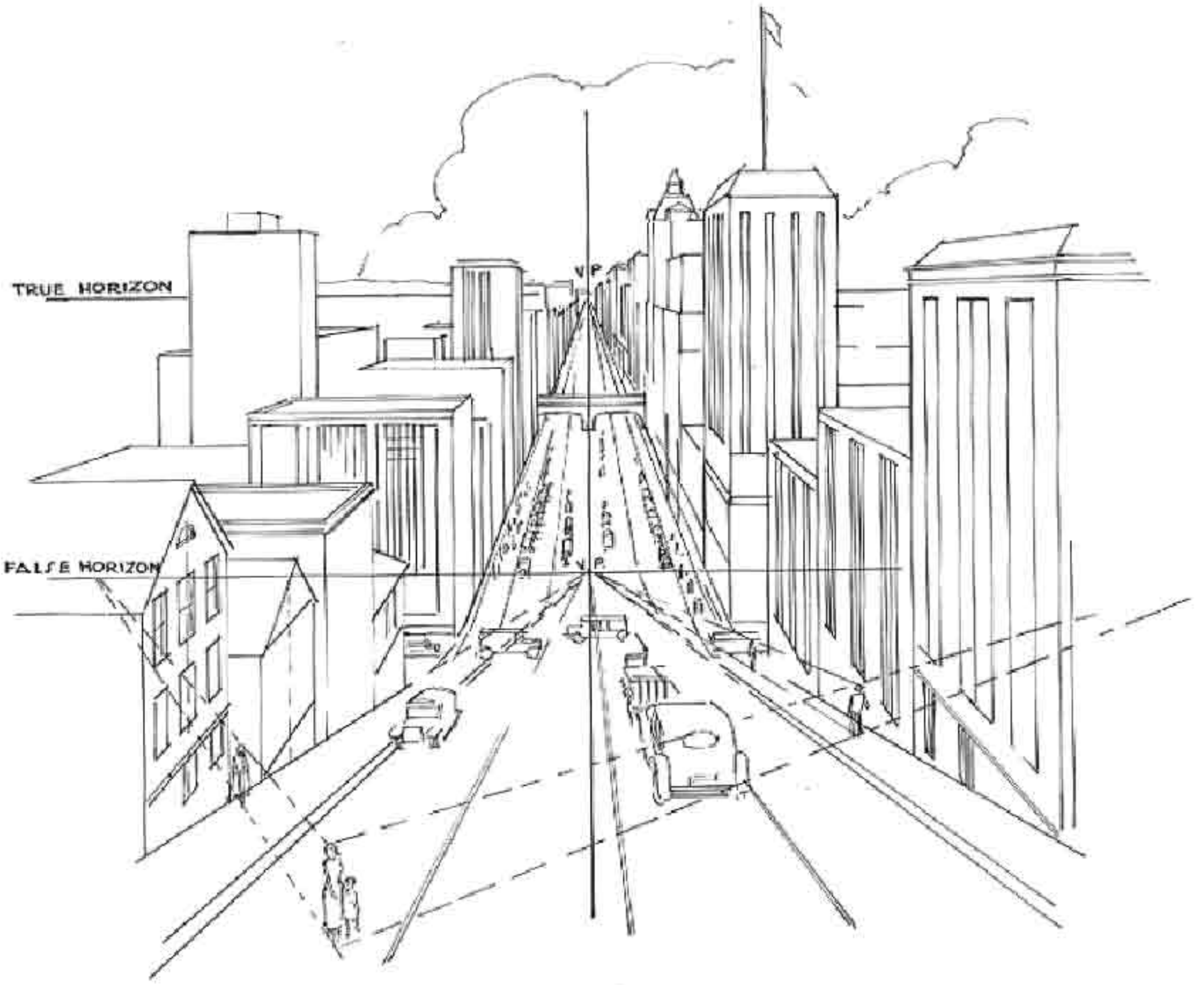
What to do when the ground plane is not level



In the drawing above, the road descends and then rises over a hillside. It then appears to drop over a crest into a valley below. This is accomplished by drawing the road in sections, each with a different vanishing point. As the angle of each section changes, the vanishing points are raised, then dropped, to follow the contours of the ground plane.

INCLINED PLANES IN PERSPECTIVE

The problem of drawing a downgrade in perspective becomes simple once you know the basic principle. A downgrade has its vanishing point below the horizon in a perpendicular line drawn through the vanishing point of the level planes. Note that there are two horizons. The upper one is the "true horizon." The lower one, not being an eye level, is a "false horizon."

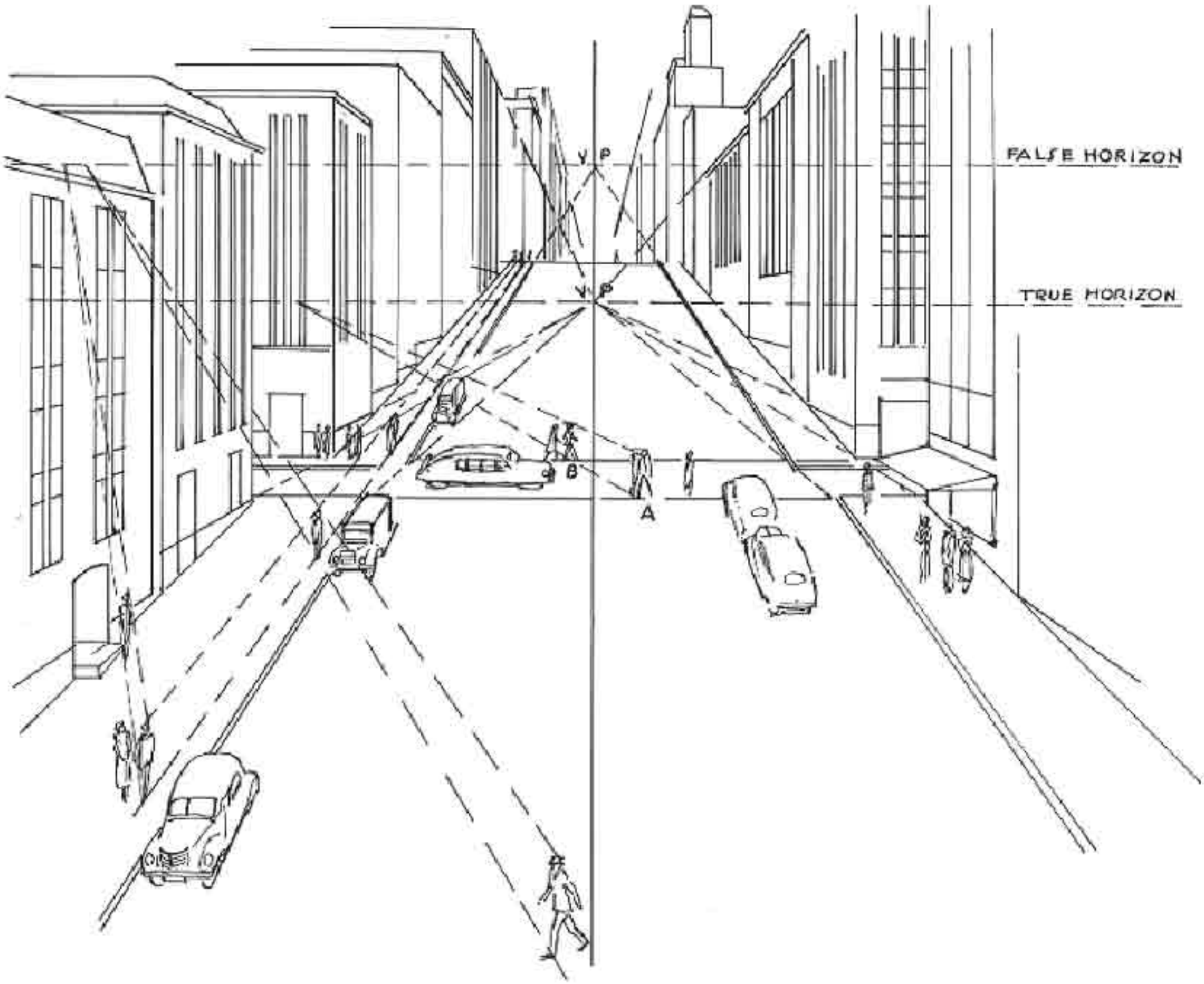


Looking Downhill

Since the roofs and floors of buildings are built on level planes, they vanish in a point on the level horizon. The sloping planes vanish in a "false horizon," above or below the ground level. The "true horizon" is always at eye level. Note that figures on the hill have been scaled to the lower horizon since they are affected by the slope.

INCLINED PLANES IN PERSPECTIVE

For an upgrade view, the perspective principle is the opposite of that for a downgrade, in that the false horizon is above the true horizon. The vanishing point of the slope falls on a vertical line drawn through the vanishing point on the true horizon.

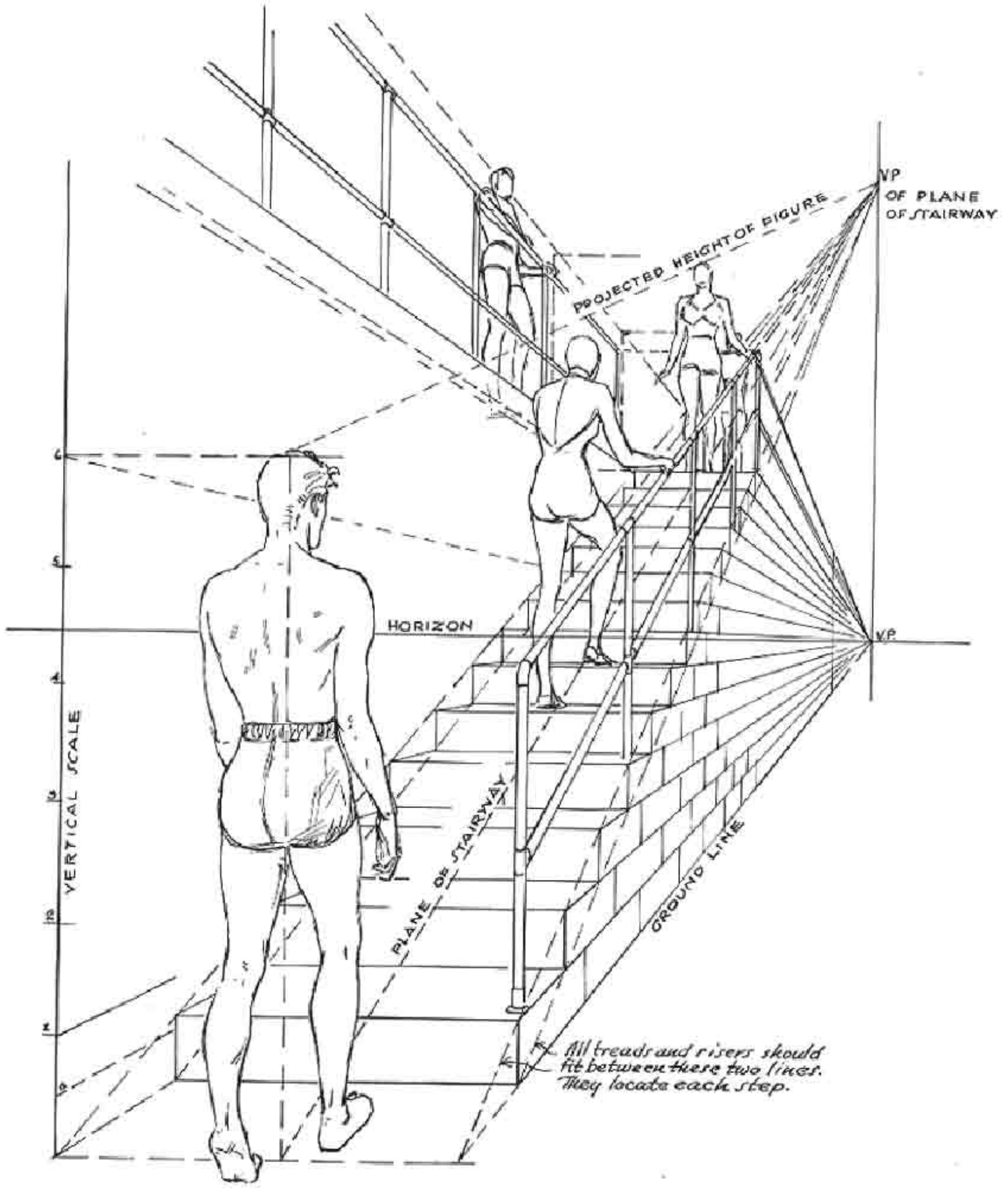


Looking Uphill

The roofs, floors, windows, base lines, and all other level planes vanish in a point on the true horizon. Any plane that is a part of the slope vanishes in the point above on the false horizon. As before, the figures are scaled to the horizon of the slope since they are stationed on an inclined plane. Figures on level planes are always scaled to the true horizon, as shown at A and B where the figures are stationed on a level crossing. Figures in windows or on balconies are scaled the same way.

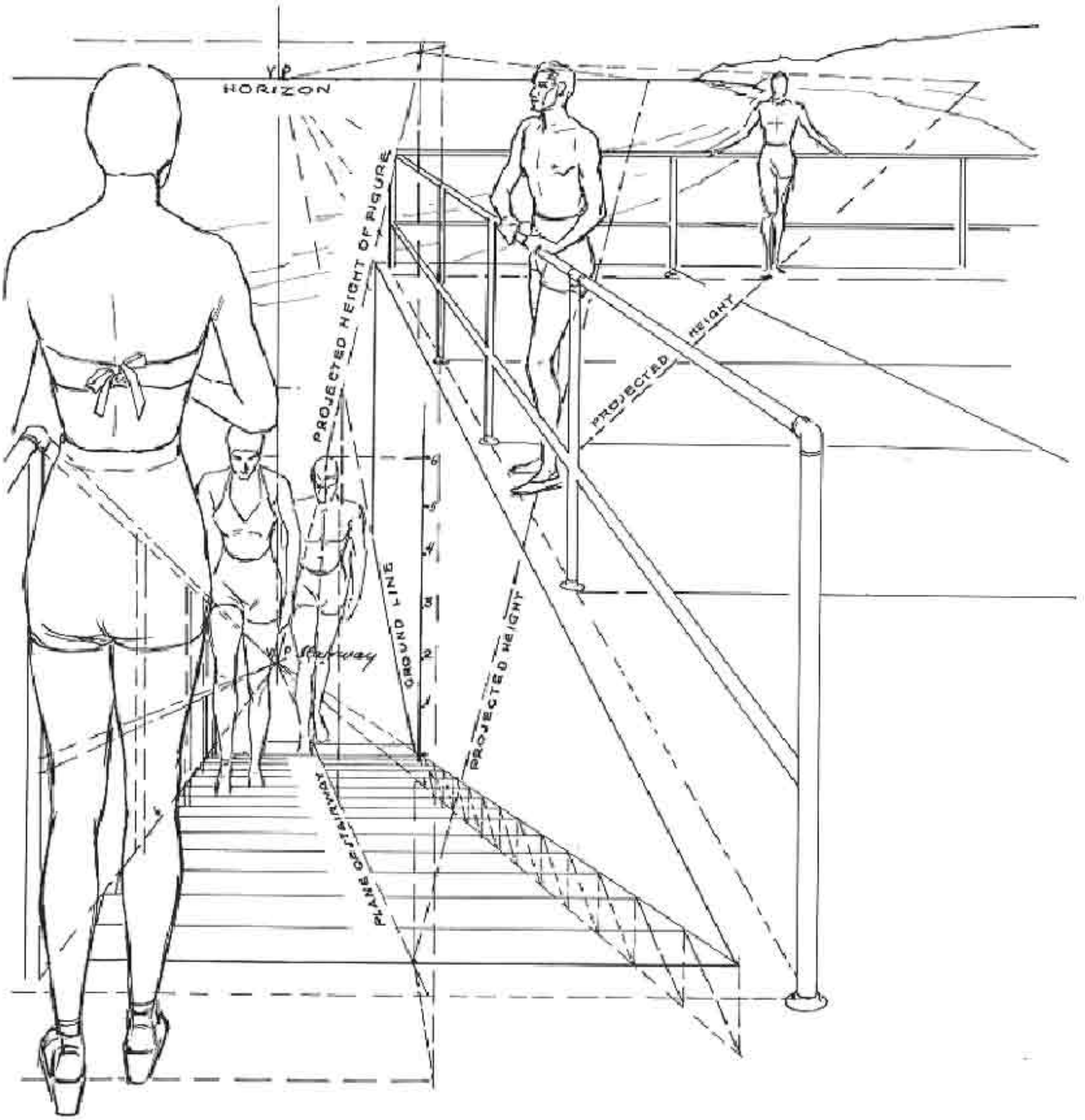
INCLINED PLANES IN PERSPECTIVE

It is important to know how to draw a stairway in correct perspective and how to project figures upon any step. This is not difficult to do. The plane of the stairway locates all the points of the risers. The treads all have the same vanishing point on the horizon. Scale the height of the risers to the figure, as shown in the drawing below.



INCLINED PLANES IN PERSPECTIVE

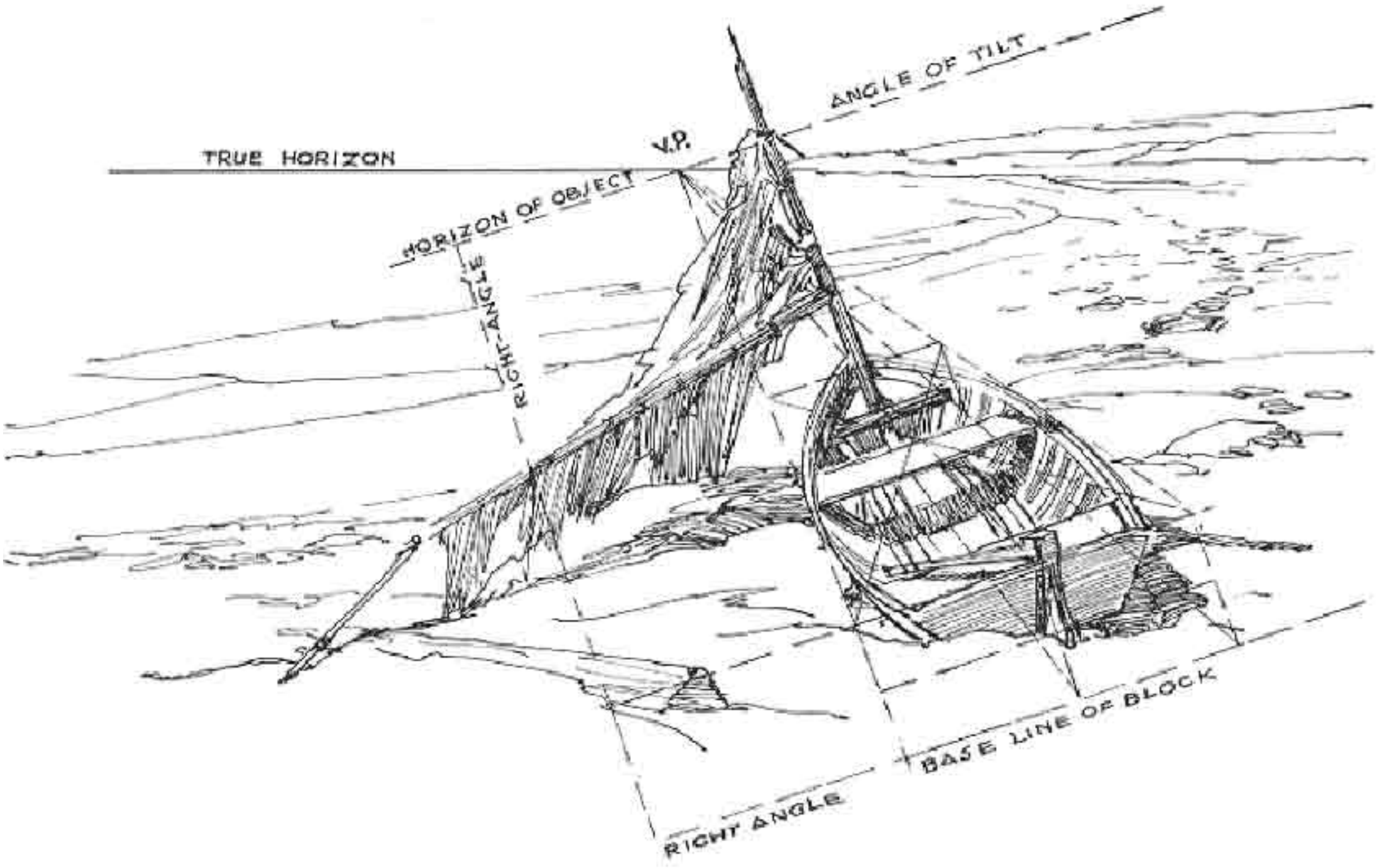
Here we reverse the problem on the preceding page, but we can still scale all the figures from the one at the bottom of the stairway. Note that we still have the two lines which give us the size of the risers and treads as they come up the plane of the stairway. The figures are in approximately the same positions.



The observer's position now appears to be at the top of the stairway looking down upon the same scene. How important is perspective!

INCLINED PLANES IN PERSPECTIVE

An artist may be faced with the problem of drawing a tilted object. The object may be falling, blown over, a squared object resting on an inclined plane, or for any reason not be in alignment with the horizon. There is a simple technique for solving this problem.

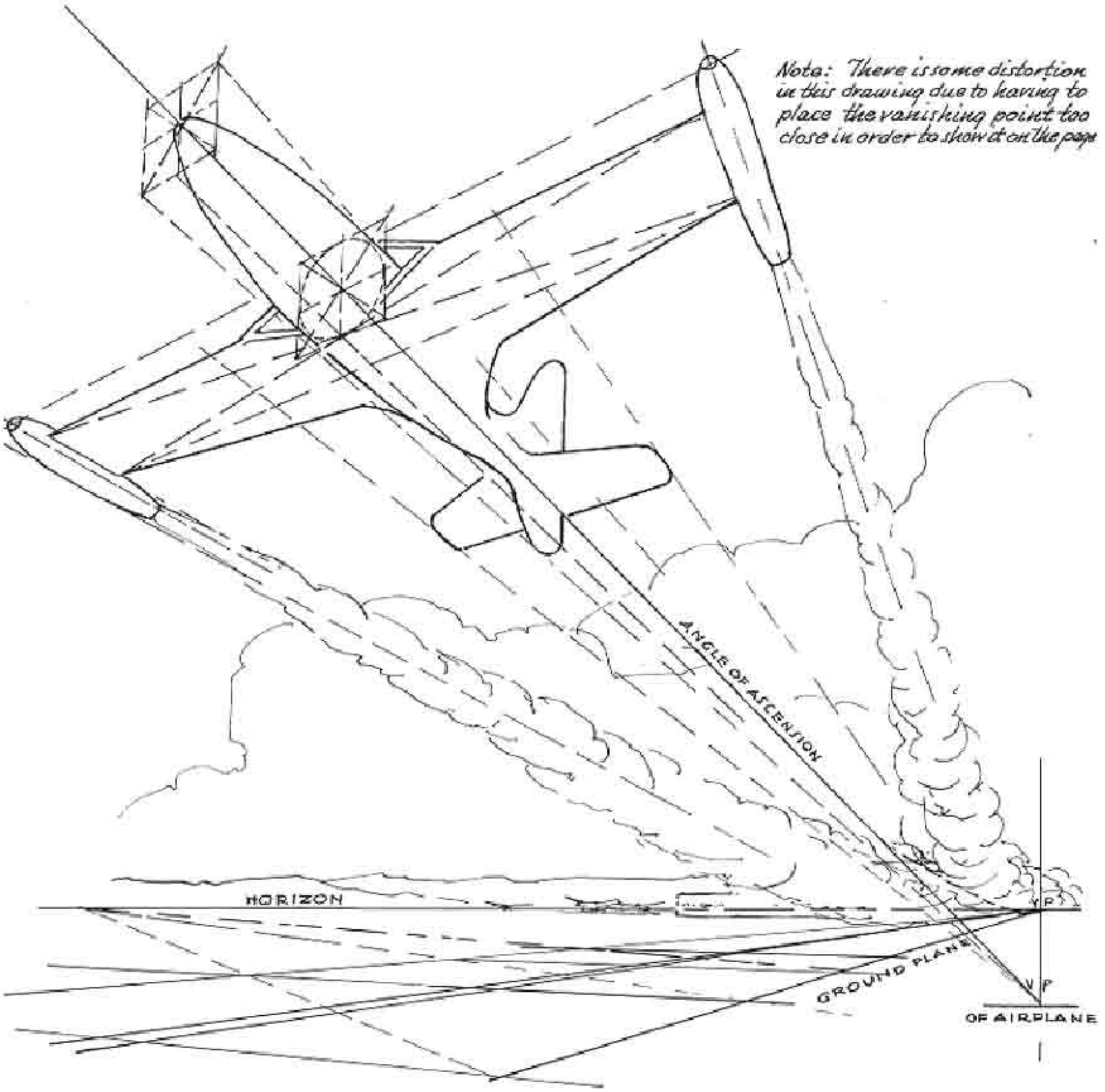


First establish a vanishing point on the true horizon. Through that point draw the angle at which the object is to be tilted. This line will be the horizon of the tilted object. Now turn the drawing and draw a right-angle down from the new horizon. From that draw another line at right angles to establish a base line for a block. Complete the dimensions of the block within which the object is to be drawn in perspective. Draw the object to its horizon as if it were on a level plane. The vanishing point should be at the point of crossing of the two horizons.

INCLINED PLANES IN PERSPECTIVE

It is important to know that any object which is not parallel to the ground plane has its vanishing point either above or below the horizon. The drawing below shows an ascending airplane.

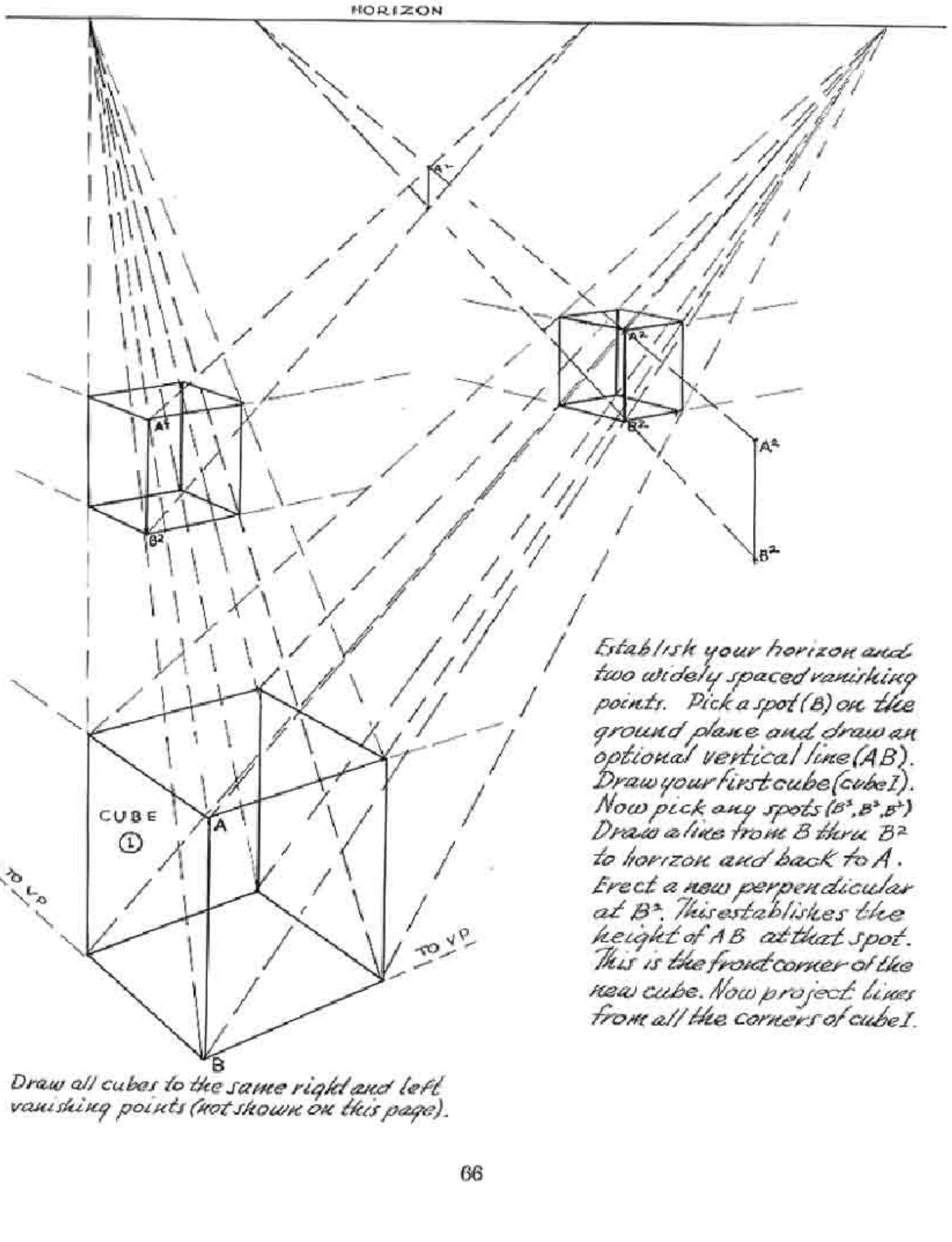
The angle of ascension starts below the horizon and comes up through the ground plane and through the center of the object.



The airplane is drawn to a vanishing point placed below the horizon. The wings vanish in a point on the horizon since their edges are parallel to the ground plane.

PROJECTING A SOLID TO ANY POINT ON THE GROUND PLANE

Since any object can be constructed within a block, the method shown on this page will enable you to duplicate any object for placement at any other spot on the ground plane. The proportions will be correct according to position and distance from the first object. The plan is to draw the block first and then the object within the block.

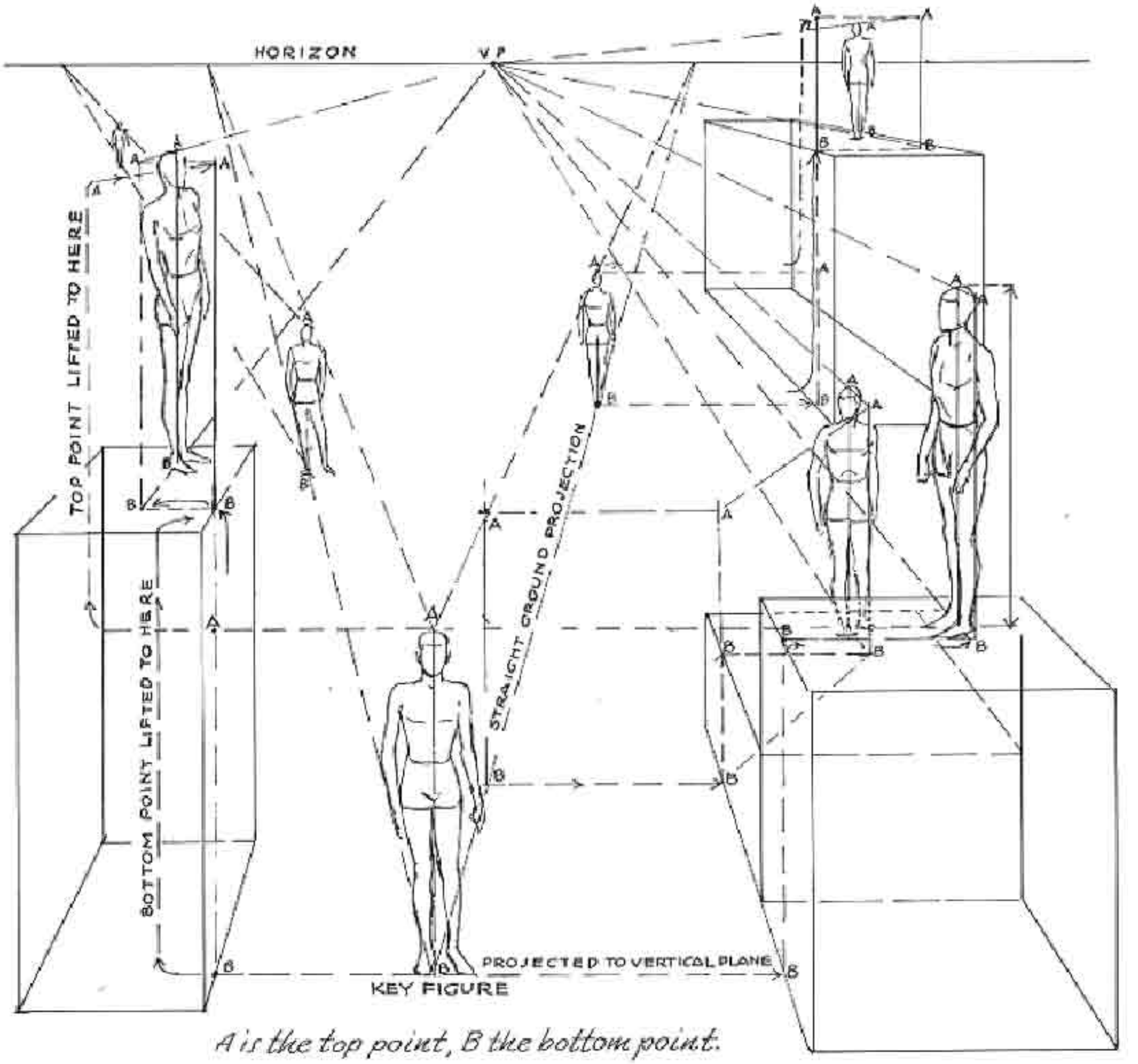


Establish your horizon and two widely spaced vanishing points. Pick a spot (B) on the ground plane and draw an optional vertical line (AB). Draw your first cube (cube 1). Now pick any spots (B^1, B^2, B^3) Draw a line from B thru B^2 to horizon and back to A. Erect a new perpendicular at B^2. This establishes the height of AB at that spot. This is the front corner of the new cube. Now project lines from all the corners of cube 1.

Draw all cubes to the same right and left vanishing points (not shown on this page).

PROJECTION OF FIGURES

Any vertical measurement, including the height of a figure, can be projected to any point in the picture. If the measurement or figure is to be shown on a plane higher than the ground plane, it must be elevated to that plane. This is done by projecting the measurement (A and B) to a spot against the elevation and lifting that measurement to the elevated plane above. Use a pair of dividers to lift the measurement.

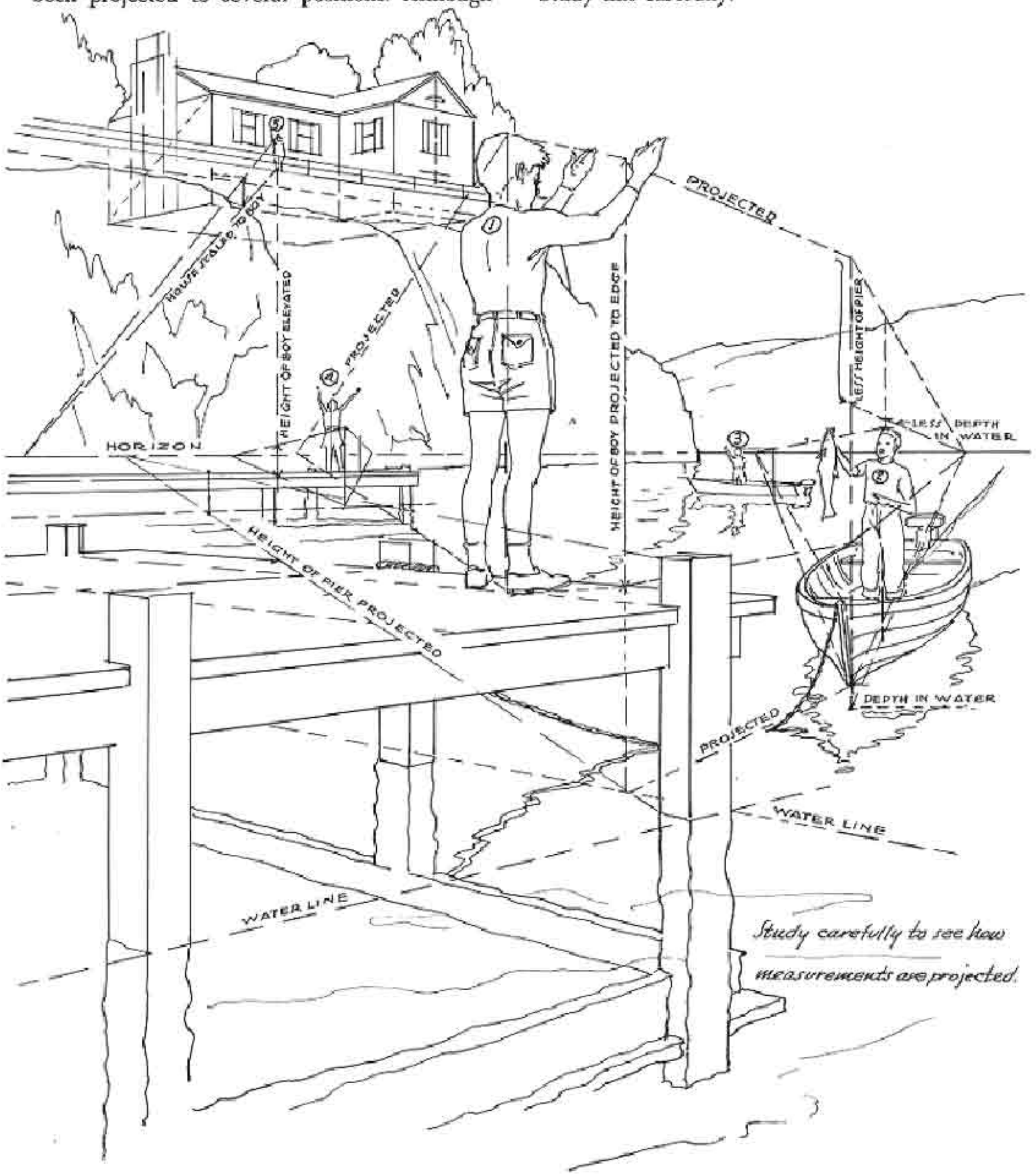


A is the top point, B the bottom point.

Author's Note: Especial attention should be given to this page, because the principles of projecting measurements as applied here are of extreme value to every illustrator or commercial artist. The following page shows how the principles apply to subjects in which the figures are at different levels. Figures must be in correct proportion to one another.

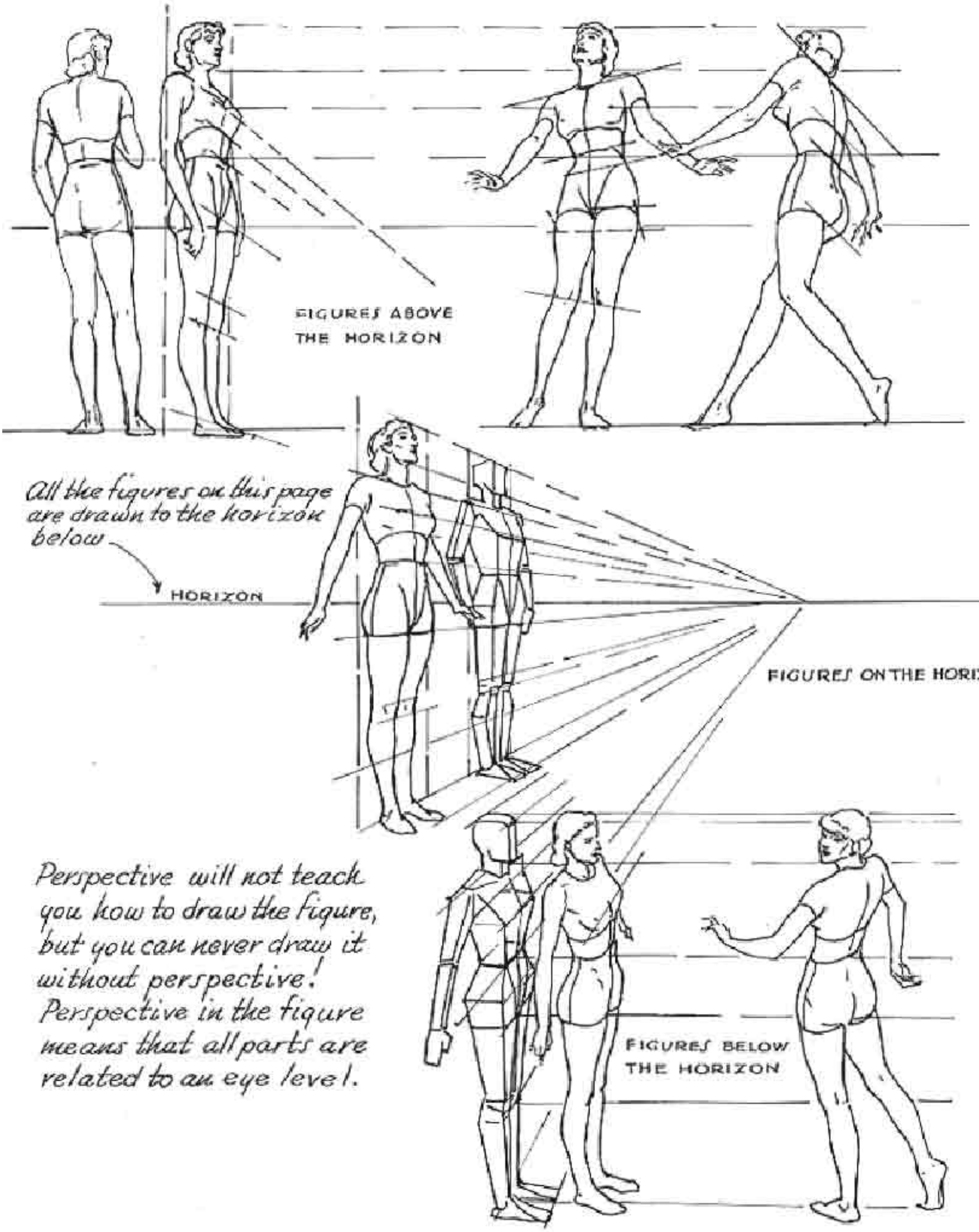
PROJECTION OF MEASUREMENTS

Everything in a picture has a relative size according to its position in perspective. In the drawing below, the height of the boy (1) has been projected to several positions. Although this drawing was made without models or copy, the relative sizes of figures and other units are convincing because the perspective is correct. Study this carefully.



PERSPECTIVE IN THE FIGURE

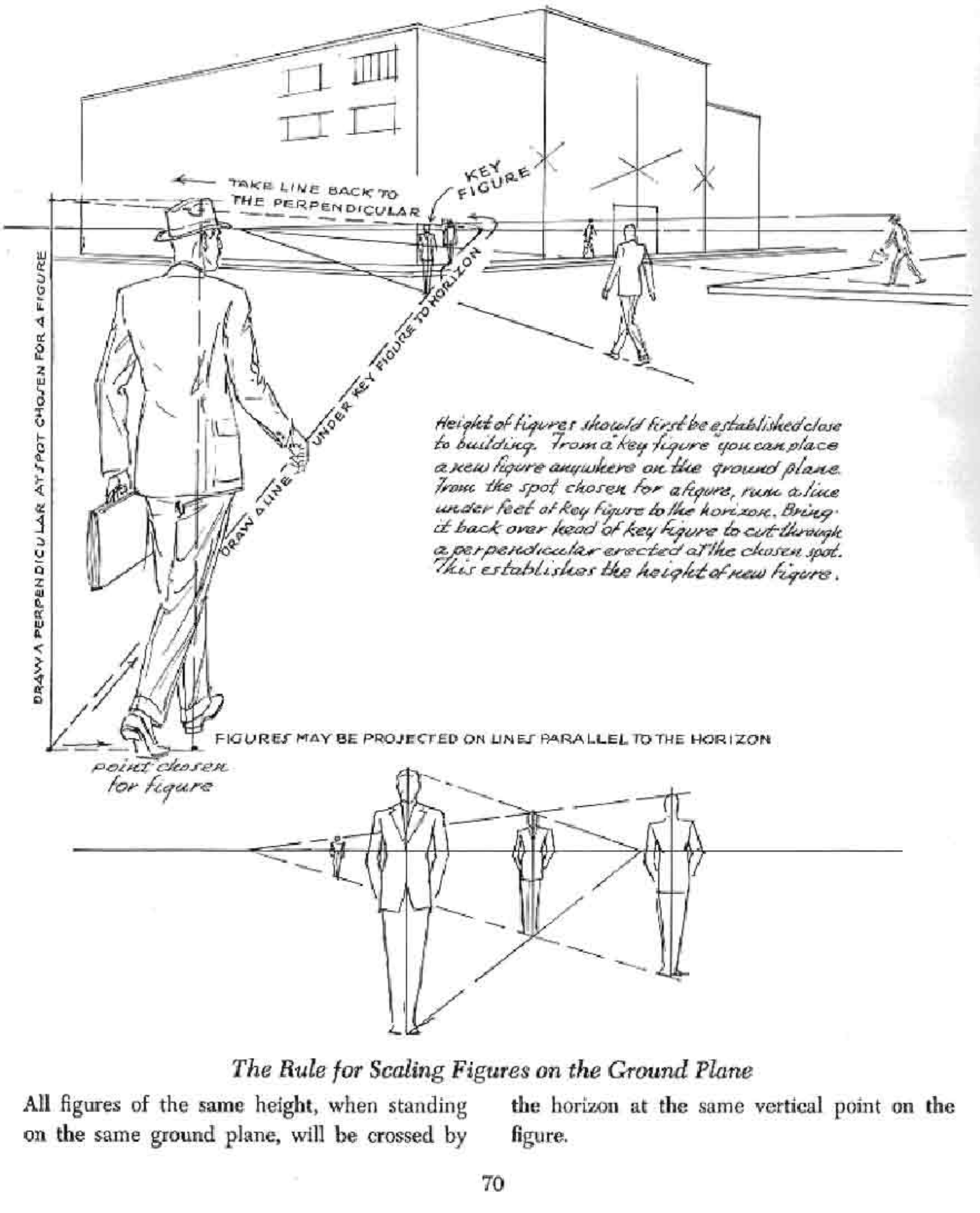
No matter how much you know of anatomy and the construction of the figure, you will not be able to draw figures from imagination until you can relate the different parts of the figure to a horizon or eye level. Sometimes it is helpful to think of the various forms as they would appear as blocks – square instead of round. Then round them out.



Perspective will not teach you how to draw the figure, but you can never draw it without perspective! Perspective in the figure means that all parts are related to an eye level.

PROJECTION OF FIGURES

One of the simplest and yet least observed rules of perspective is that all figures on the same ground plane must be related in size. To be sure of the correct relation, establish the height of a "key" figure and scale all others from that height. To do this, draw a line from the feet of one figure under the feet of another to the horizon. Then carry a line back to the first figure.

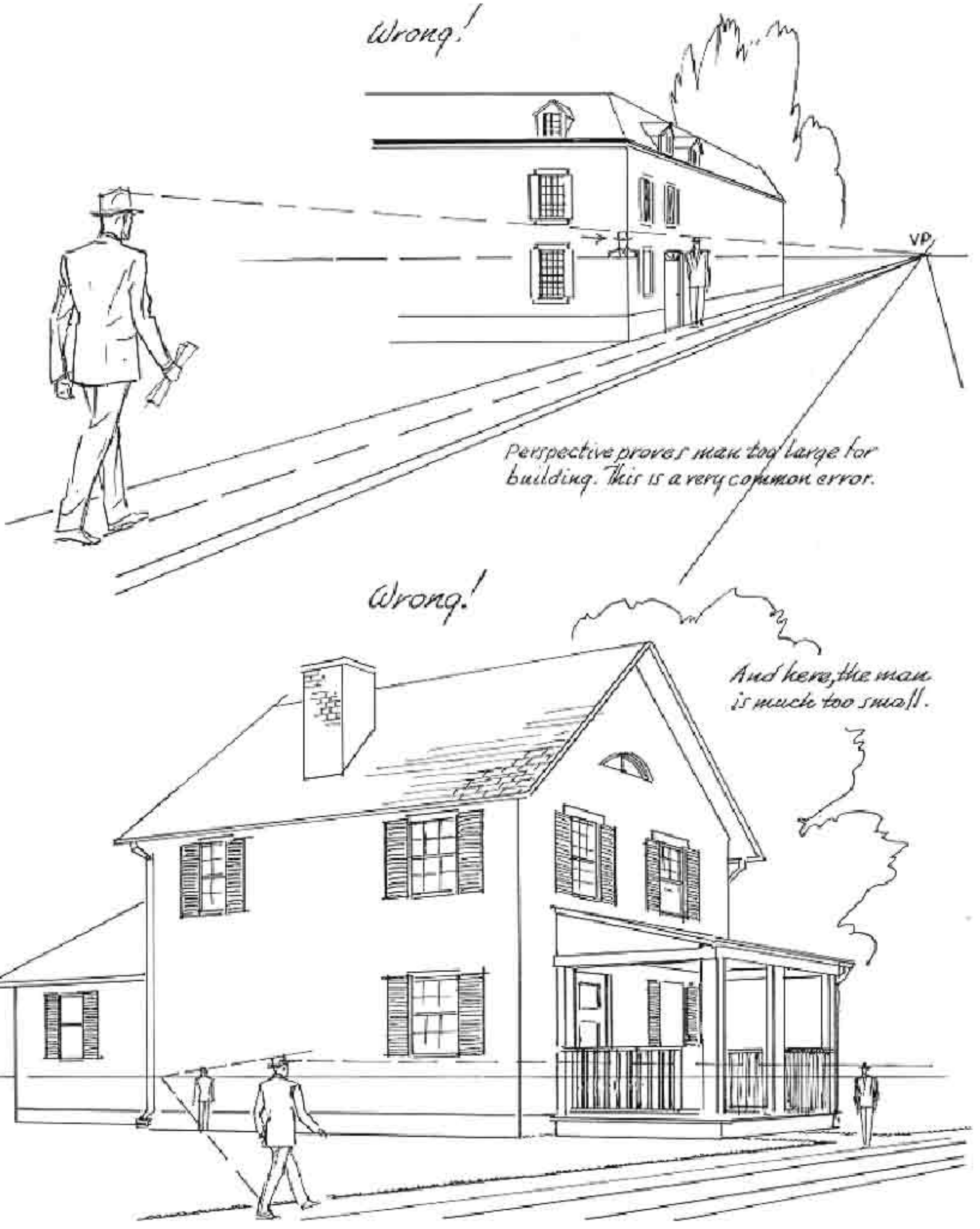


The Rule for Scaling Figures on the Ground Plane

All figures of the same height, when standing on the same ground plane, will be crossed by the horizon at the same vertical point on the figure.

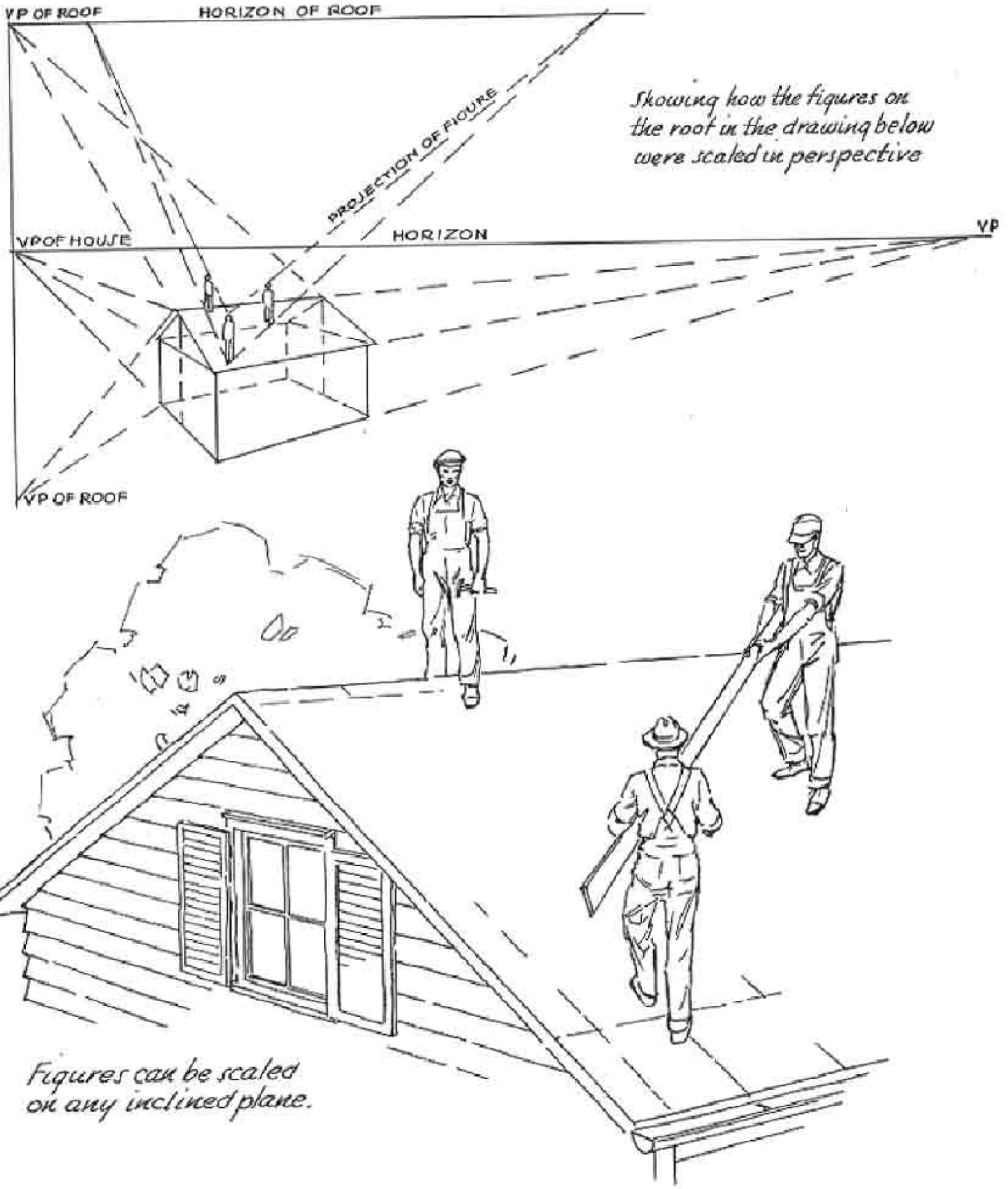
PROJECTION OF FIGURES

When it is so easy to scale a figure to any spot on the ground plane, such errors as those shown below are unforgivable. If the feet of a figure do not show, any portion of a figure may be projected, as, for example, the head and shoulders of the man in the drawing below. Remember always to scale your figures. Don't guess — you can't.



FIGURES ON INCLINED PLANES

When we know that an inclined plane has a horizon and vanishing points which are used in the same manner as those of a level plane, scaling figures on an inclined plane becomes much simpler. So long as the entire plane has the same slant, the perspective is worked out in the manner shown in the diagram below. The diagram shows all the necessary vanishing points.

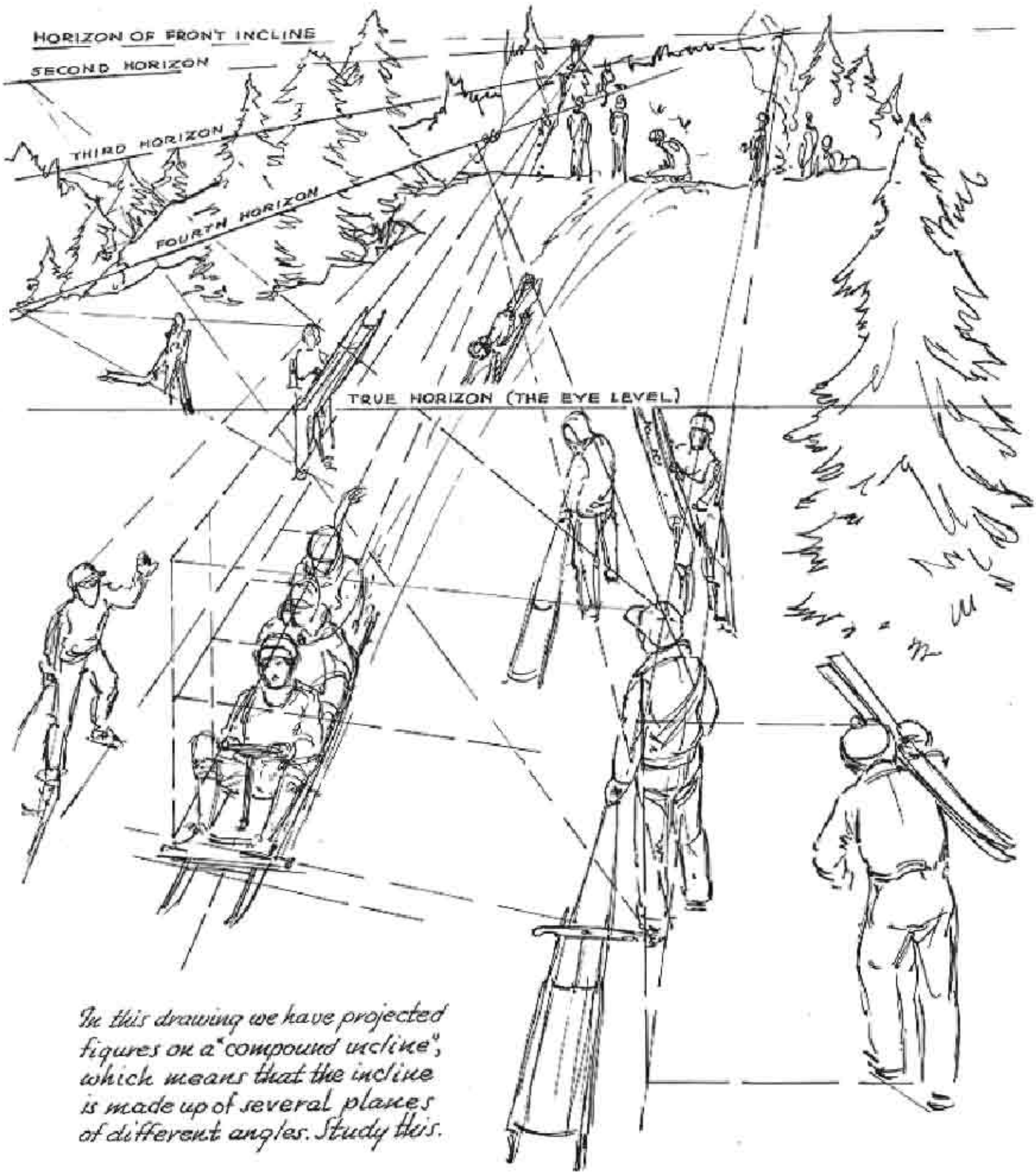


Showing how the figures on the roof in the drawing below were scaled in perspective

Figures can be scaled on any inclined plane.

FIGURES ON INCLINED PLANES

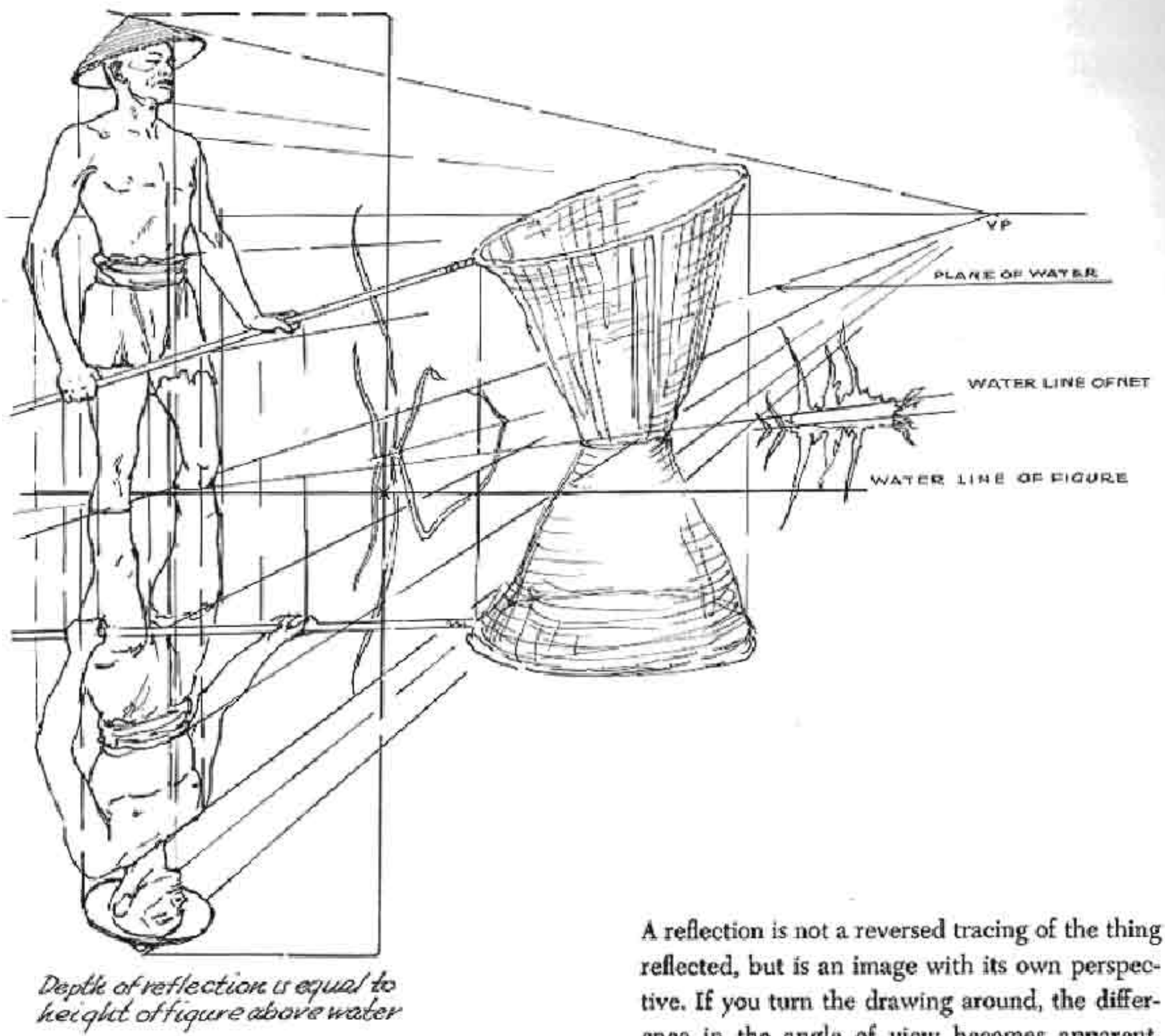
The projection of figures on hillsides can be very puzzling if the principle is not understood. The drawing below offers a simple solution. Whenever the plane changes as it goes around the hill, we draw to a new horizon. To keep only one horizon would continue the same plane at the same incline to infinity.



In this drawing we have projected figures on a "compound incline", which means that the incline is made up of several planes of different angles. Study this.

REFLECTION

Many artists do not realize that a reflection does not duplicate the perspective of the original. The perspective of the reflection is that which the actual object would have if it were inverted and placed in the position of the image. Though the proportions are duplicated, the actual drawing is quite different.

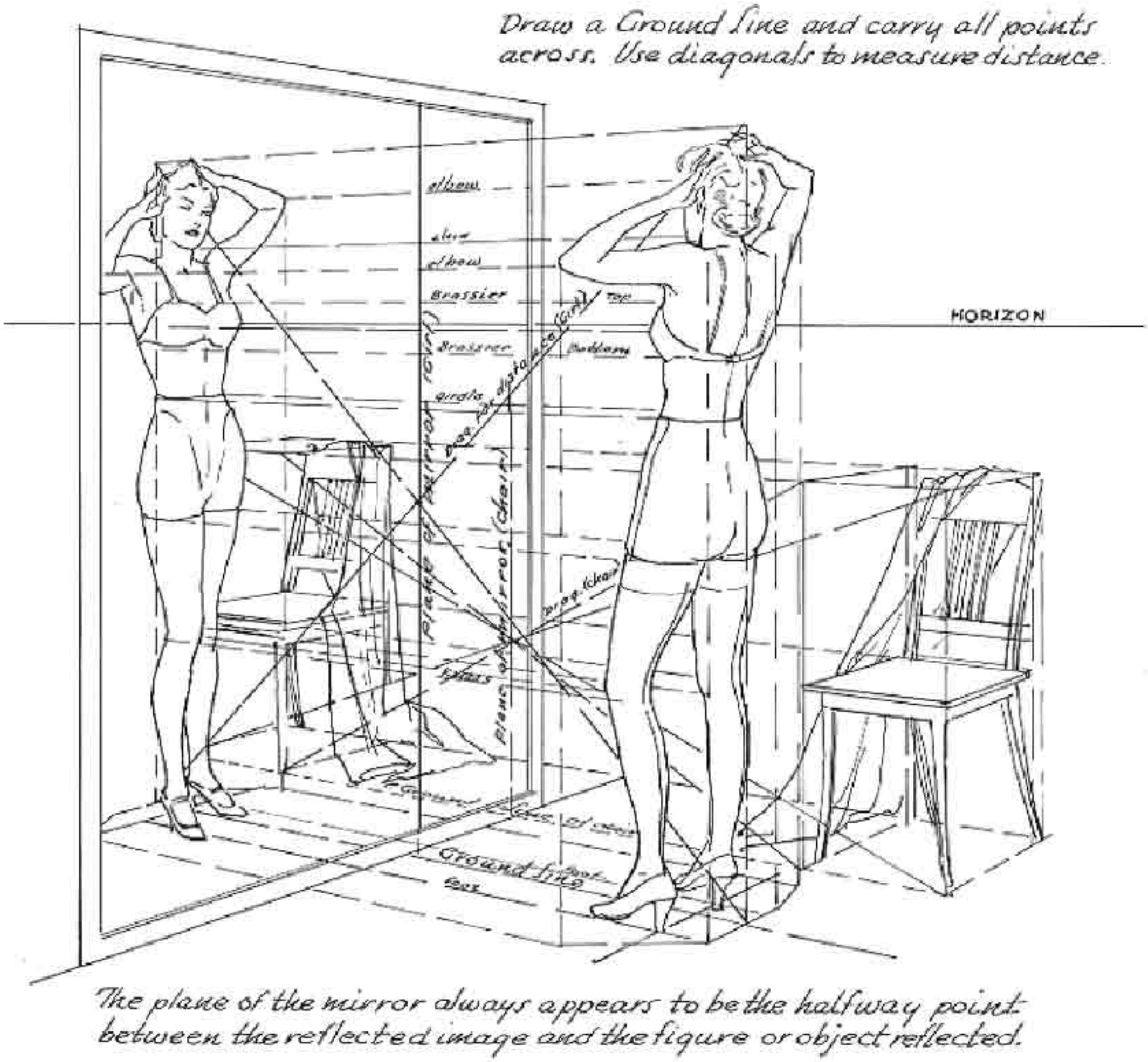


Depth of reflection is equal to height of figure above water

A reflection is not a reversed tracing of the thing reflected, but is an image with its own perspective. If you turn the drawing around, the difference in the angle of view becomes apparent. The figure and its image attach at the water line. All points of the figure must be projected down to a similar point on the image, which is directly below. Both the figure and its reflection are drawn to one vanishing point on the horizon. Any movement of the water affects the reflection.

REFLECTION

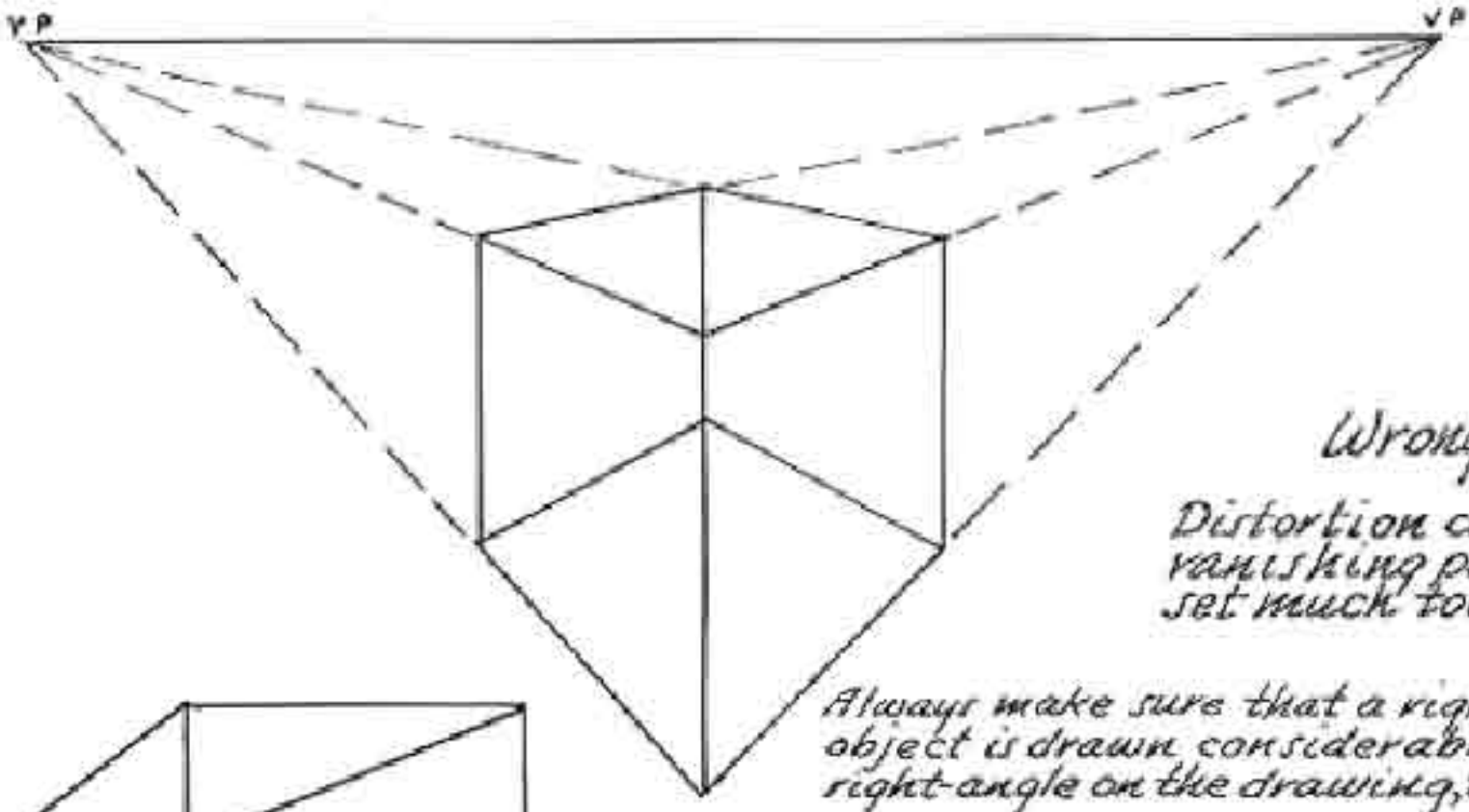
The artist who is not skilled in perspective may have difficulty in drawing a reflection in a mirror. The drawing below makes the process simple. With a fair knowledge of the figure a reflection can be drawn without copy. Study this drawing carefully to see how all parts of the figure have been projected.



The plane of the mirror always appears to be the halfway point between the reflected image and the figure or object reflected.

COMMON ERRORS IN PERSPECTIVE

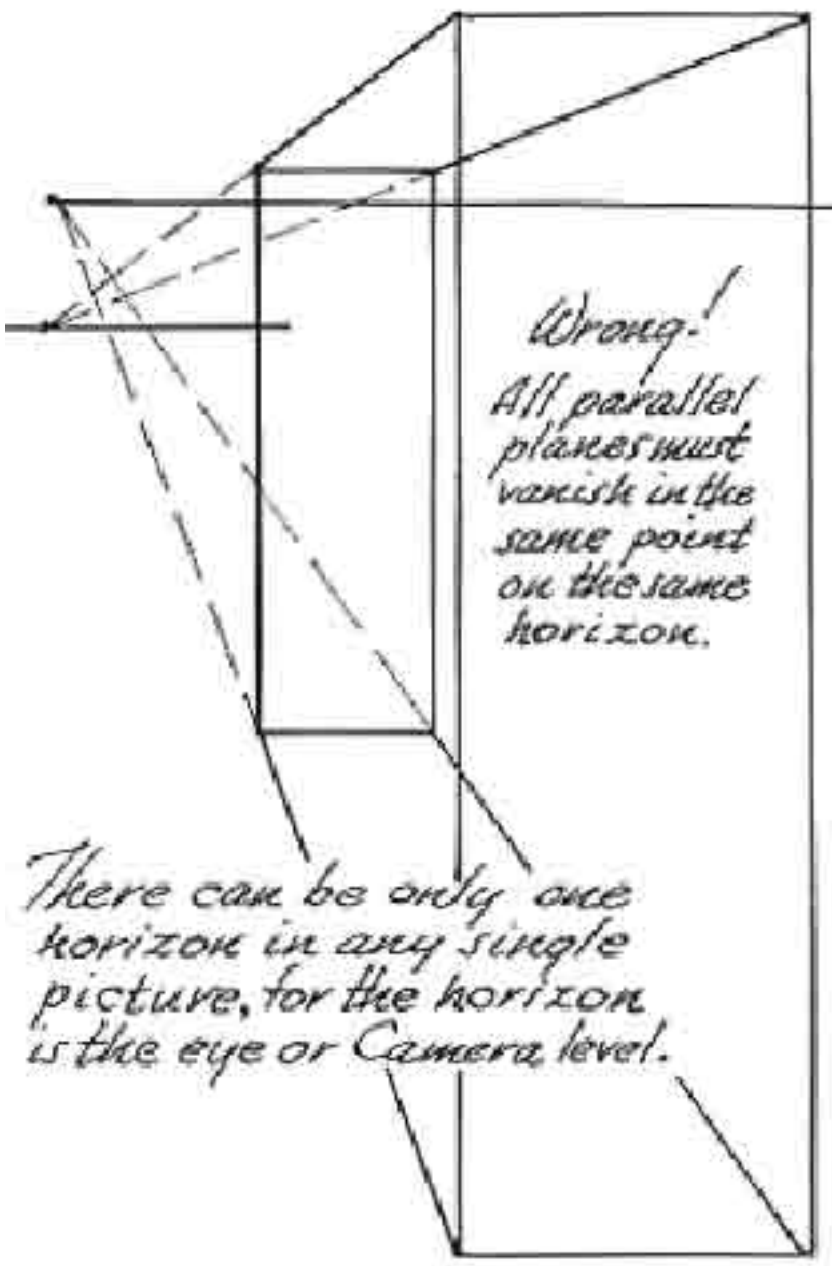
Distortion results from having both vanishing points within the field of vision, or too close to the object. If the object has a right angle at the near corner, the base lines must make an angle greater than a right angle on the drawing, since a right angle can not be represented by anything less than a right angle. The drawing below shows this common error.



Wrong!

Distortion caused by vanishing points being set much too close.

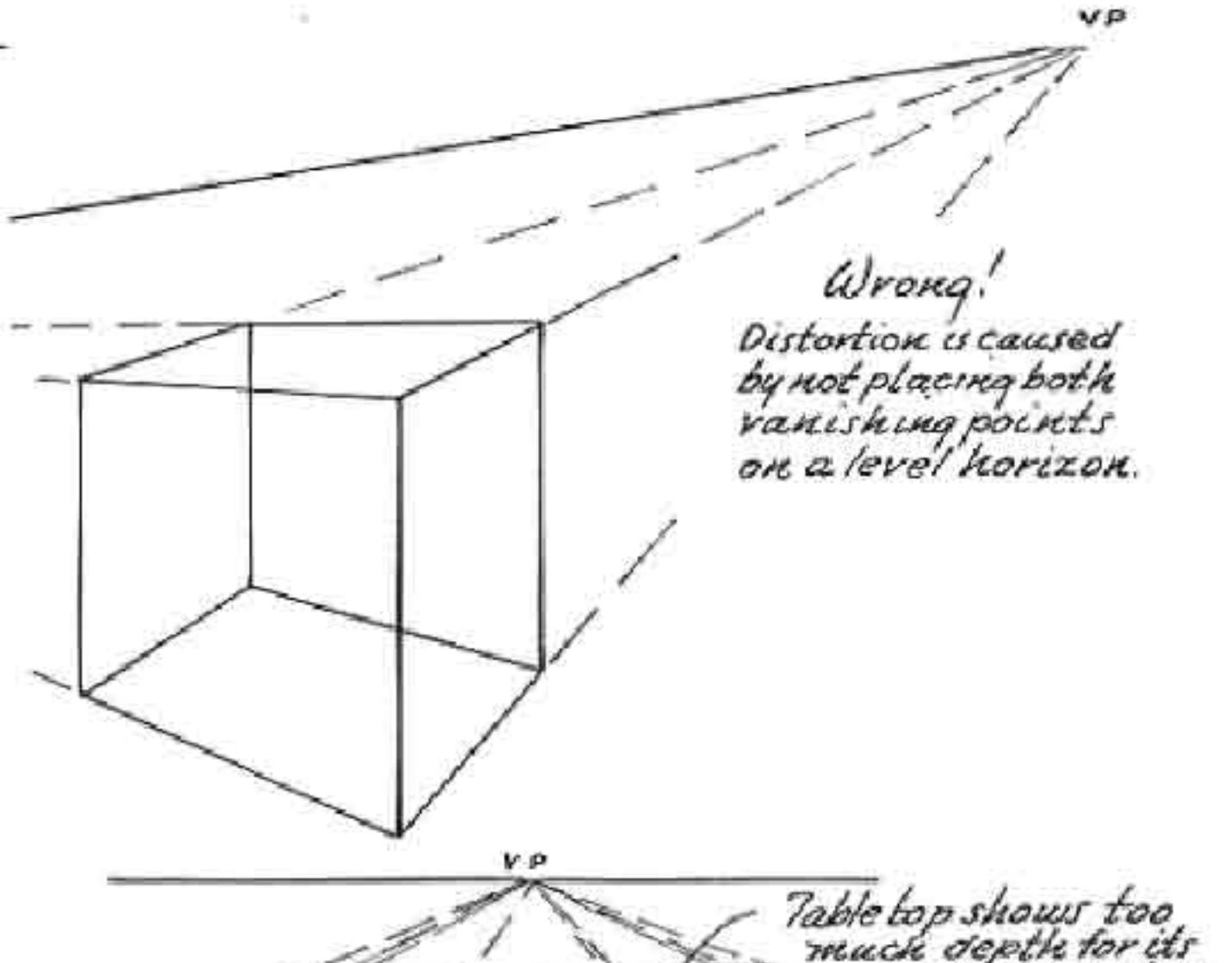
Always make sure that a right-angle on the object is drawn considerably wider than a right-angle on the drawing, to avoid distortion.



Wrong!

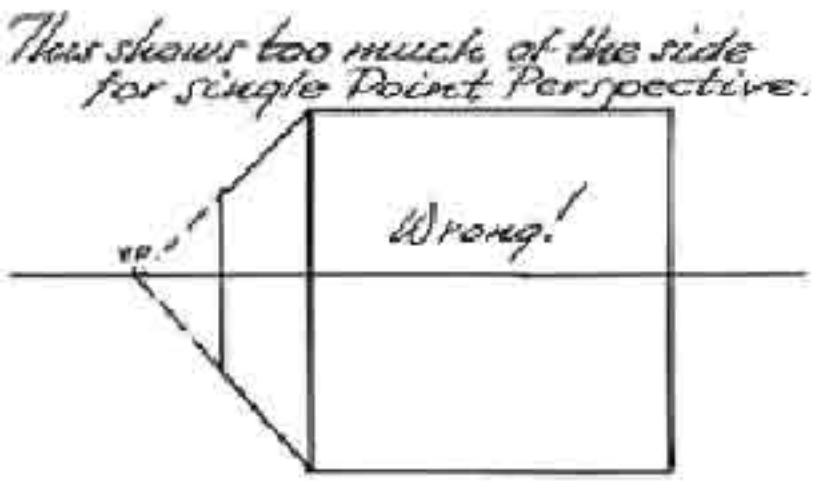
All parallel planes must vanish in the same point on the same horizon.

There can be only one horizon in any single picture, for the horizon is the eye or Camera level.



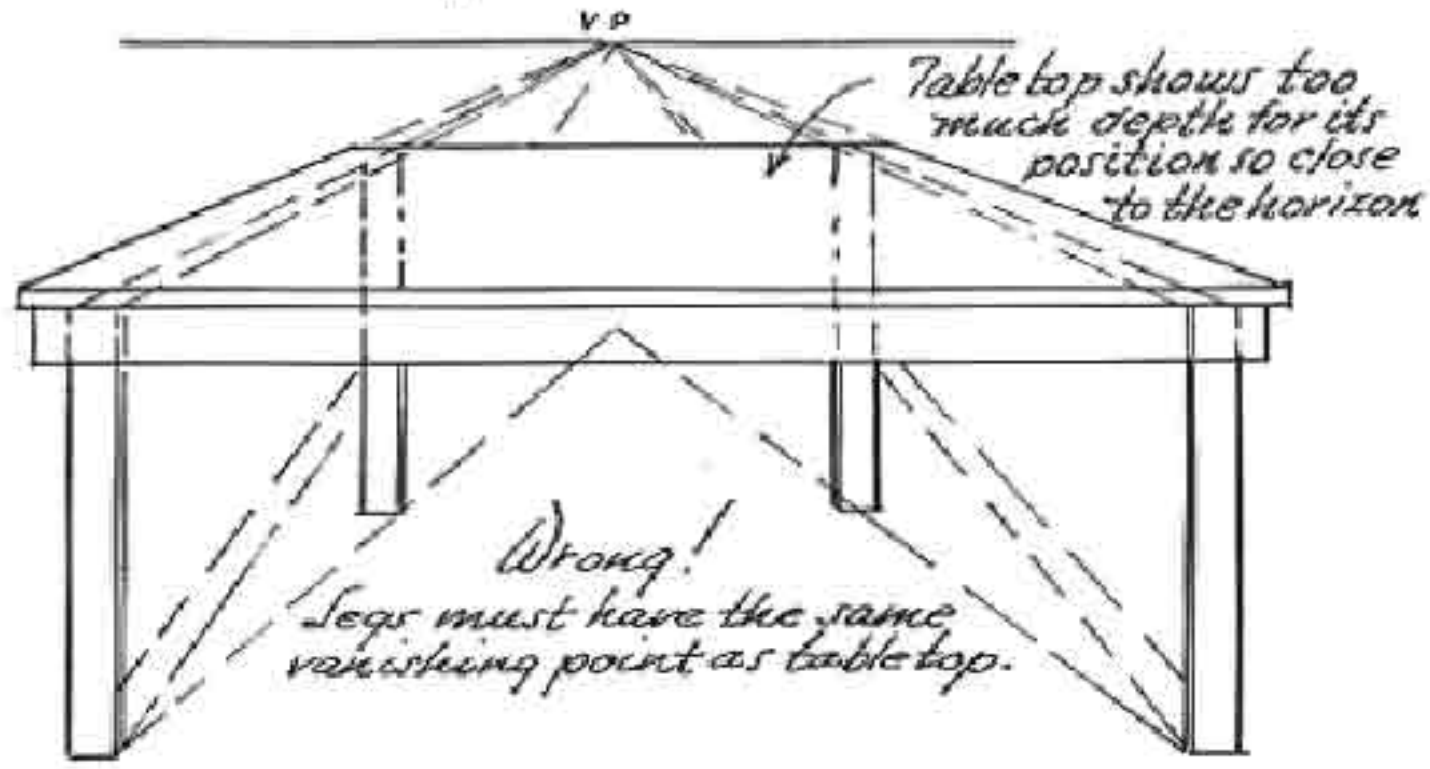
Wrong!

Distortion is caused by not placing both vanishing points on a level horizon.



This shows too much of the side for single Point Perspective.

Wrong!

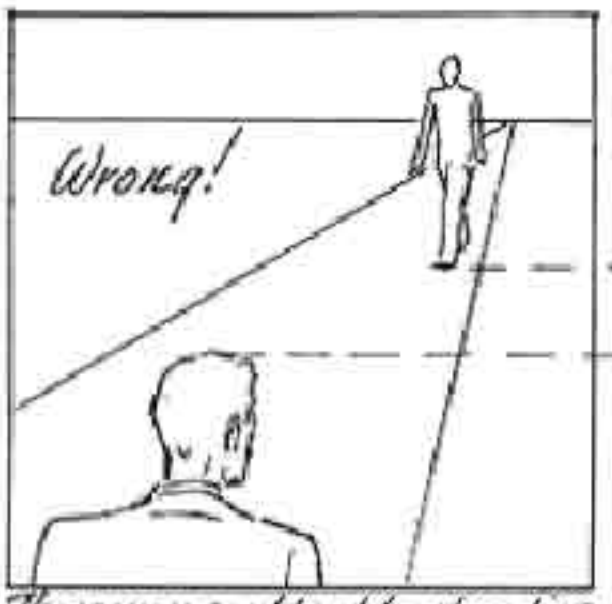


Wrong!

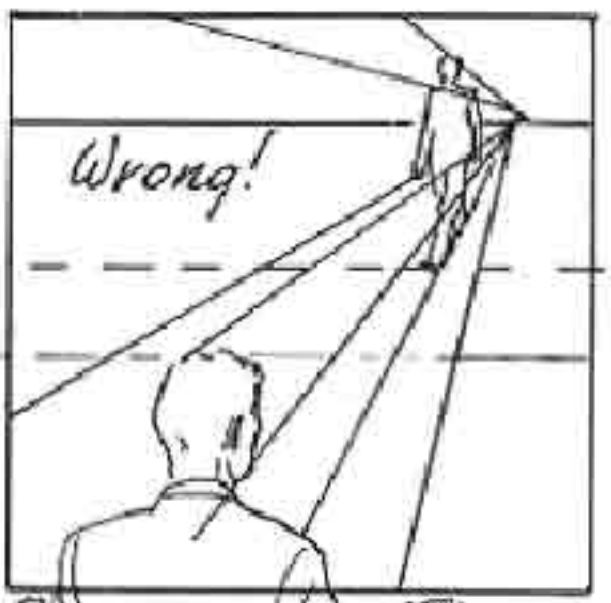
Legs must have the same vanishing point as table top.

COMMON ERRORS IN PERSPECTIVE

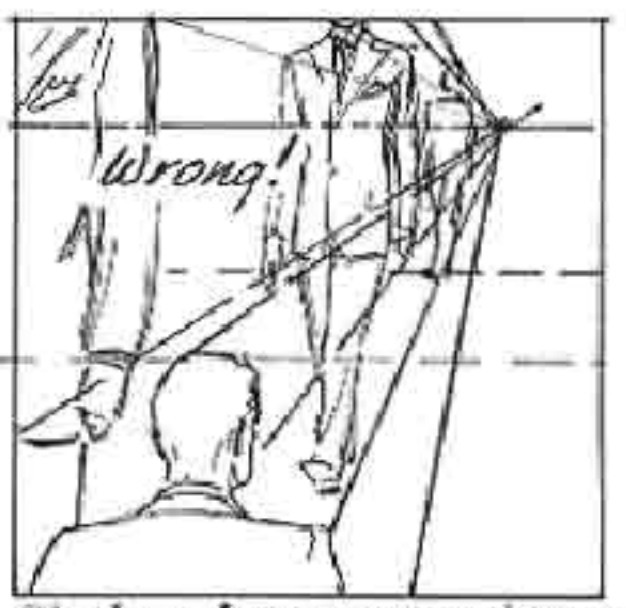
Too few artists follow the simple plan of projecting figures to a horizon and a vanishing point. In perspective, figures are no different from fence-posts and no harder to scale correctly. It is easy to scale any vertical unit or measurement to a horizon, but the failure to do so occurs again and again in otherwise good work.



There men could not be standing on the same Ground Plane.

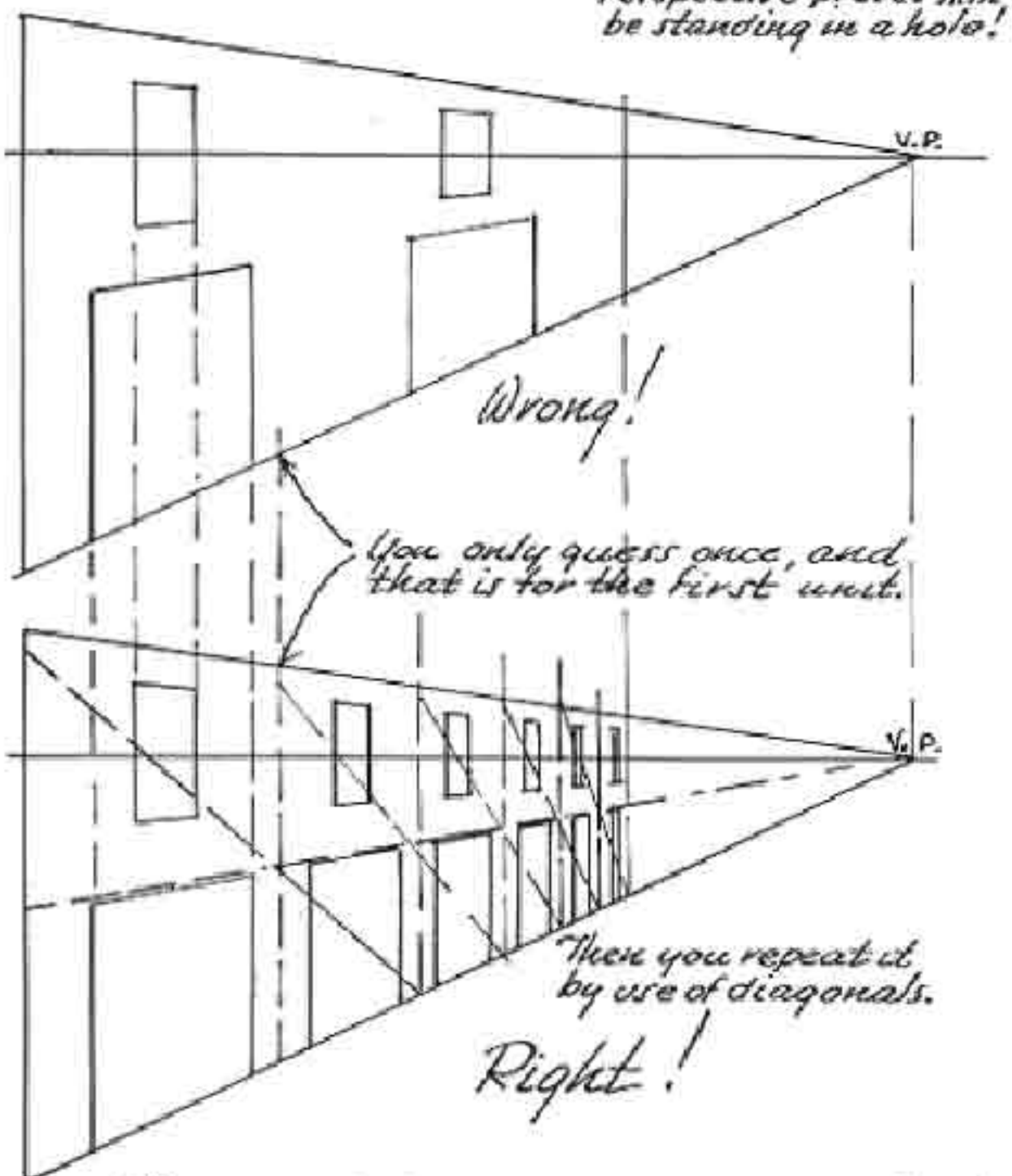


Perspective proves him to be standing in a hole!



The back figure would tower over him in reaching the spot.

To correct: Make sure that the horizon crosses all similar figures on the same ground plane at the same vertical height on each figure.



The most common error of all is "guessing at perspective depths." This immediately stamps an artist as a novice and ignorant of the basic principles of good drawing. At the left we have taken the first door and window as a unit and, by the use of diagonals, proved that the drawing above would have enough depth to repeat the unit six times! Until the artist knows how to measure depth, it is quite impossible for him to produce a correct three-dimensional effect.

The error below is in stretching Single Point Perspective too far. If the unit at the right is a cube, we have taken too much depth.