LESSON XXVII

PERSPECTIVE

It is very important for the student to understand something about perspective in order to be able to place chairs, tables, etc., in his drawings; rugs and squares on floors must be drawn according to rule. A few simple rules are here given to aid the student in the perspective needed in fashion drawing. Study these rules carefully and apply them when copying pictures.

When copying the chart, draw in large enough scale to enable you to work well; these illustrations are very small. *Be very accurate* as every fraction of an inch will tell. Use a ruler on all straight lines and a compass for circles.

There are two kinds of perspective, *parallel* (or one point) perspective, and *angular* (or two point) perspective.

The *horizon* (H) is an imaginary horizontal line, where earth and sky seem to meet; it is high or low according to the elevation of the observer.

Example. A person on a mountain can view more of the surrounding country than if he were on the level, hence the horizon will be high as it is directly on a line with his eyes.

Place your pencil across your eyes, if you can see just over the top you have the horizon line.

The *point of sight* (PS) is an imaginary point on the horizon directly in front of the eyes. The *direction of vision* is an imaginary line from the eye to the point of sight.

The *picture plane* is a vertical plane on which the picture is drawn.

The *ground plane* is the plane on which the observer stands.

The place he stands (S) is called the *station point*, Fig. 3. This is the eye of the observer.

The picture plane is perpendicular to the ground plane.

Example. Place a large plane of glass perpendicular to the ground. Place a cube on the other side a little way back. Keep the eye steady and trace on the glass the outline of the cube. If this is done accurately, you will have a picture of the cube in perspective. Close one eye while doing this.

All parallel lines which run directly away from the observer are called *converging lines*. Converging lines which are perpendicular to the picture plane vanish in the point of sight. (Fig. 1) and (Fig. 5 3 ft.)

Converging lines which are not perpendicular to the picture plane but run obliquely away from the observer, vanish in a point on the horizon, but not in the point of sight. (Fig. 5 (2 ft.))

The *prime vertical* (PV) is a vertical line drawn perpendicular to the horizon. It passes through the point of sight and through the station point. (Fig. 3.)

Study Fig. 3. H is the horizon, PS is the point of sight, S is the station point. Place the station point at a distance of $1\frac{1}{2}$ the diagonal of the picture plane. PV is the prime vertical, abcd is the picture plane.

D and D′ are distance points, or as far as the observer can see on each side of the point of sight. From PS to D equals from PS to S. D^2 is one-half this distance; its use will be explained later.

Study Fig. 5. Find H and PS.

When wishing to represent objects by measurement, a measuring scale can be used in the foreground. This measuring

scale should be the actual measurement in feet and inches. As objects recede, they appear smaller, just how much smaller can be determined by using this scale.

In Fig. 5 let us call the spaces in the foreground feet. If a six-foot post were placed close to the (glass) picture plane (on the other side), it would appear six feet, or life size; if placed farther back it would look smaller. See the posts.

To place a six-foot post a distance back, count off three feet on the scale, connect the ends with PS. Any horizontal line (parallel to the picture plane) between these lines will equal three feet. The farther back the shorter three feet will appear.

Take the three feet in the distance, double it and stand it up on the three-foot line. This makes six feet in the distance; or take the six-foot measure on the scale, find six feet on the ground in the distance, then stand it up.

PARALLEL PERSPECTIVE

An object is in parallel perspective when one of its sides is parallel with the picture plane, Fig. 1.

Draw the picture plane, the horizon, the point of sight. Draw the fronts of the blocks, then the converging lines, then the backs of the blocks. Place the rug on the floor, using the same rule.

The block at the left of the point of sight exposes its right side. The block at the right exposes its left side. The block in the center has both sides hidden.

Remember a block, chair, table or any object lower than the level of the eye will show the top, so all converging lines will run up to the point of sight.

Objects higher than the level of the eye will extend higher than the horizon, and all converging lines above the eye will run down to the point of sight. (Fig. 6.) The relation of the object to the horizon determines the size of the object. When drawing children, make a high horizon, this will make them look small.

If an entire object is above the level of the eye, you see its under part. A plane on a level with the eye has the appearance of a line. If below the eye, it exposes its upper part. If above the eye, it exposes the under part. The higher or lower a plane is placed, the more one can see of its under or upper surface. A plane at a distance loses in depth.

Fig. 2 is a room in parallel perspective. Find H, PS, and the converging lines. Study the lines of the bureau which is built in the form of a block. The top of the bureau is below the eye and the top of the back above the eye.

Build all furniture away from the wall from the floor up. Note the lines for the beginning of a table. The floor lines converge (up) to PS. The ceiling lines converge (down) to PS. When drawing bureaus, chairs, etc., the student is inclined to show too much of the top planes. Fig. 4 shows how to obtain the correct measurement.

First study Fig. 3. Draw picture plane, horizon, point of sight, prime vertical, station points and distance points. As the paper is rarely large enough to draw DSD′, we use one-half the distance (D′) and one-half the measurements on the measuring scale.

We are to decide how much to show of the seat of the chair, Fig. 4. A is the length of a horizontal line in perspective; to obtain the same length on the converging line draw the broken line (auxiliary line) from the end of A equal to one-half the measurement of A. Draw a dotted line from the end of the auxiliary to D′; this will cut the converging line the correct length or so that a=A. Use whole measurement and dotted line to D or half measurement and dotted line to D2.

To cut the converging line coming forward from A, connect the end of the

auxiliary with the opposite D2. This makes A=a=aa, Fig. 4.

Lines drawn from both ends of the auxiliary to the picture plane will give one-half measurement of A, or on the measuring scale, the actual size in feet or inches. This rule will be very helpful when drawing windows and doors which open toward you.

One picture I saw will explain the usefulness of this rule. The window was divided into two parts, being on hinges. These opened toward me, the mistake being that one part was large enough to cover the whole window when closed.

Use this rule to ascertain the length of the converging lines of the chair, Fig. 4, and the table and bureau, Fig. 2.

To obtain the depth of the window, drop lines to the floor converging line.

Place the rungs of the chair according to rule.

The back of the chair slants back slightly. Parallel oblique lines in the air converge to the same point on the prime vertical. In this case they meet below the horizon. If the slant were in the opposite direction, they would meet above the horizon. Obtain the slant of one side of the back, then draw the other side to the same point.

Study Figs. 6 and 7, which show how a circle or an oval can be drawn in perspective. Draw a circle in full view, enclose with a square, cross the square from corner to corner up and down and across through the center, and again up and down and across where the circle meets the cross lines. Continue these cross lines to PS. Place the circle at the junction of these lines on the converging square, Fig. 7; this will give you a vertical ellipse (or a circle in perspective).

A horizontal circle in perspective may be obtained by filling the top converging plane with the same kind of lines. This rule will help you when drawing oval mirrors, children's hoopies, curves on furniture, etc.

Draw an oval mirror on the bureau in Fig. 2. Draw a basket in Fig. 8.

ANGULAR PERSPECTIVE

An object is an angular perspective when neither side is parallel with the picture plane. In Fig. 9 we have a box in angular perspective.

Draw picture plane, horizon, point of sight, prime vertical and station point, also distance points the same as you did in parallel perspective. The measuring scale in the foreground may also be used but instead of using D and D′ use M and M′.

You will note that this station is not $1\frac{1}{2}$ the diagonal of the picture plane.

Remember, when neither side of the object is parallel to the picture plane, both sides are on the slant.

To draw the cube, draw the height, and one vanishing line to the horizon; where it touches the horizon we call V or vanishing point. You may place this line on any slant. When drawing from a real cube, hold your pencil along the line and get the direction this way. Remember, if the near edge of the cube is *on* the prime vertical at an angle of 45°, you see as much of one side of the cube as you do of the other. Both sides will vanish at equal angles and the vanishing points will fall on D and D′, but the minute you move the cube at another angle or change its position to the right or left, the vanishing points will change. So in a room, different objects have different vanishing points while objects in parallel perspective all vanish in the point of sight.

This cube is to the right PS. You see more of the one side than you do of the other, the vanishing line will fall elsewhere on the horizon. The greater the slant of one side the more gentle the slant of the other, the vanishing point on the side with

the greater slant will be nearer PS than the other vanishing point.

You know the angle of the object is really a right angle, so after finding one vanishing point V, draw the line from V to S (or station point), and at the station construct a right angle. Continue this line to the horizon, which will give V′ or the other vanishing point.

You know that parallel oblique lines vanish in the same point, so the parallel sides of the cube vanish in the same points. How much of the side is seen we determine by M and M′ instead of D and D′.

Using a compass and with V as a center and VS as a radius, mark off the horizon M. With V′ as a center and V′S as a radius, mark off the horizon M′. These points are used as D and D′ in parallel perspective.

Draw the auxiliary lines the same length as the height of the cube, then the dotted line to M and M′. The parallel sides of the cube vanish to the same points. Carry measuring lines forward to obtain the size on the scale.

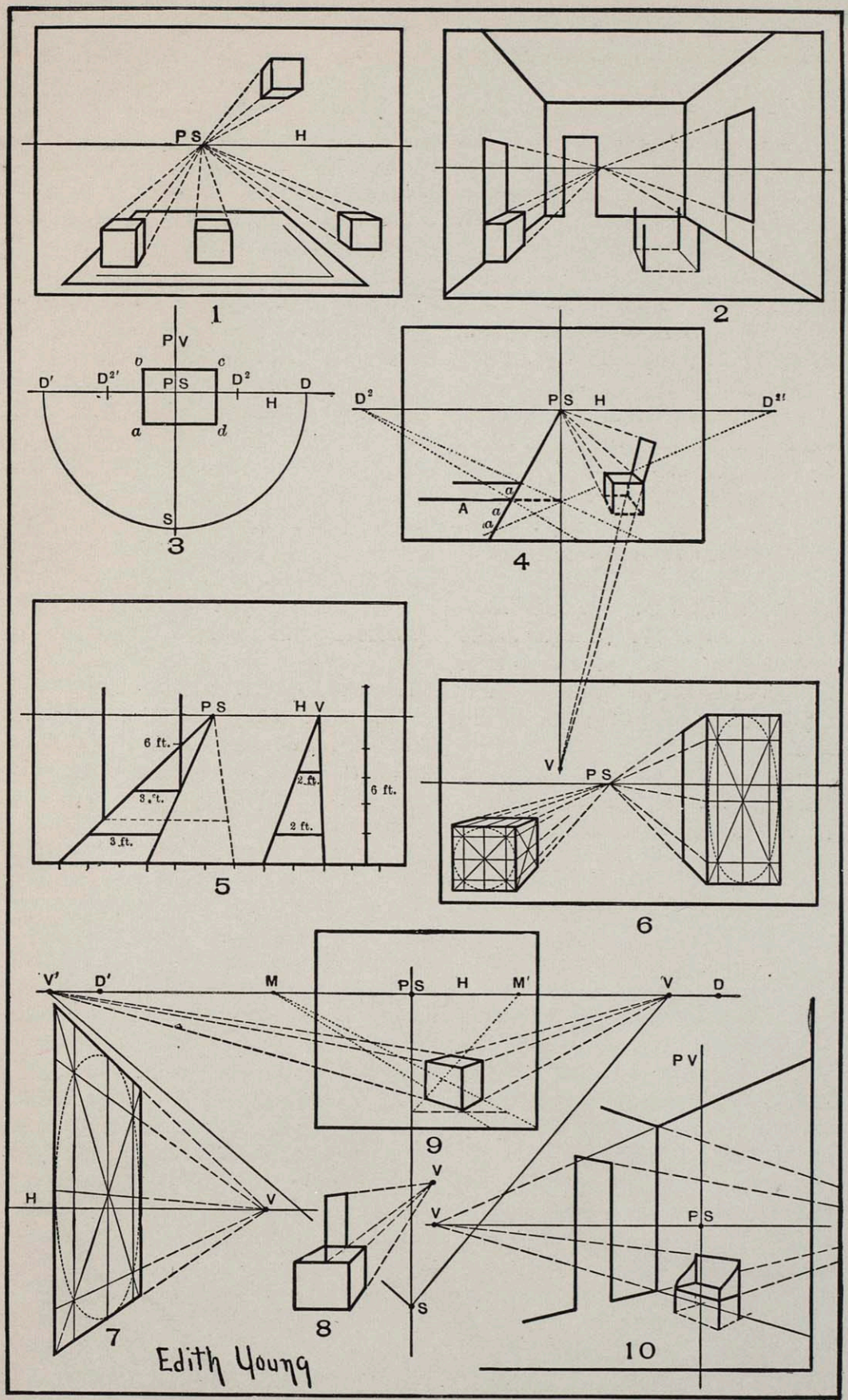
Fig. 10 is an angular view of a room; it is like the inside of a large box.

Draw the picture plane, horizon, point of sight, prime vertical, station point, distance points and measuring points as in Fig. 9. The lines of the ceiling come down to V and V′. One vanishing point is not on the paper, so slip another paper under your drawing, extend the horizon and continue the converging lines to the vanishing point.

The lines of the door follow the wall. The lines of the seat follow the other wall, and therefore the vanishing points for walls, door and seat are the same.

A room in parallel perspective may contain objects which are in parallel perspective and objects which are in angular perspective. If several objects in a room are at different angles, each one has its own vanishing and measuring points, while the converging lines of the parallel objects vanish in the point of sight, the same as the lines of the room. A room in angular perspective may contain objects at the same angle and objects at different angles and objects in parallel perspective.

Cut out a picture of a room with furniture in angular and parallel perspective, paste the cut-out on paper, and extend two converging lines; where they meet will be the horizon.


PS
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