Painting the Total Picture

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Abstract

Using the sphere surface as a canvas allows the artist to capture the total picture.

Wanting to Capture More Space

My interest in painting for many years now has been to capture the total picture. To me, the total picture is everything you can see around you—the up, down and all around physical world— when you rotate about one fixed point in space. I have mainly played with this idea on what is now called a Termesphere. A Termesphere is a painting on a sphere that captures a 360° view; it hangs and rotates from a ceiling motor, affording the viewer a moving panorama.

My own drawings led to this interest in capturing more of the scene; they seemed to want to pull in more and more space. The 90 degrees of the horizon that two-point perspective gave me was not enough. My flat drawings started to move into curved-line perspective in order to pull more information into my pictures.

Watching the Cube Change

As I look back at my early studies, I see that it was a different approach to perspective that allowed me to come up with six-point perspective on the sphere. When I first learned about perspective, it had to do with vanishing points and lines projecting to these points on the horizon. I learned one- and two- point perspective in the seventh grade and revisited it in my early college years. It wasn't until I was teaching that I started to break down the concept of perspective to its basic elements. When I had to come up with a way for elementary students to understand this concept, I realized that it had to be simplified.

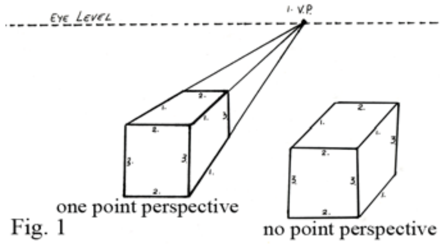


Fig. 1

This is when I looked at the cube and watched the way it changed its shape when depicted in one-, two-, three-, and four-point perspective. A cube is made up of three sets of parallel edges, usually depicted as running up-down, left-right, and front-back. One-point perspective projects the front-back set to a vanishing point, while edges in the other two sets continue to run parallel. The cube looks different than it would look with no perspective *(Figure 1)*.

Two-point perspective takes the latter two of the sets of parallel edges and extends them to different vanishing points, but the up and down edges still run parallel *(Figure 2)*. In three-point perspective, each of the three sets of edges has a vanishing point *(Figure 3)*. Comparing Figures 1, 2, and 3 you can see how these different perspective systems change the shape and look of that individual cube— the drawings of the cube look different from each other because of the different ways they project.

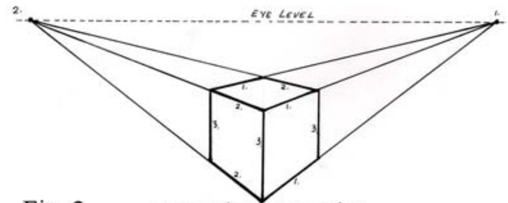


Fig. 2 two point perspective

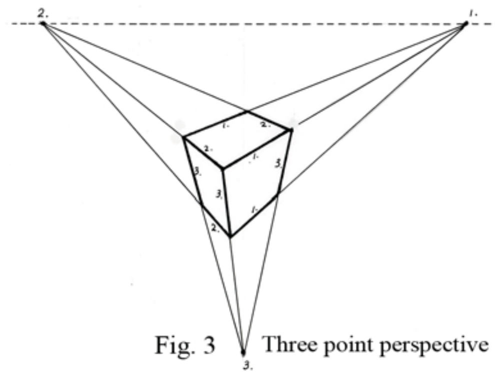


Fig. 3 Three point perspective

Four-point perspective makes a major jump because it starts to use curved-line perspective. Four-point perspective is used when the up-down edges of a cube extend across the horizon line from a point above your head to a point below your feet. Depending where the cube is located on the page, this set of up-down edges now curves, or bulge out. This bulging happens because this set of lines is going to two different vanishing points, one above your head and the other below your feet *(Figure 4)*. Now let's look at a cube that is in five-point perspective. Here, the front-back edges project to a single point, and the other two sets of parallel edges each project to two different vanishing points; these edges will be somewhat curved *(Figure 5)*. Finally, in six-point perspective on the sphere each set of parallel edges of the cube projects to two different vanishing points; most of the time, all the cube's edges will bulge out *(Figure 6)*.

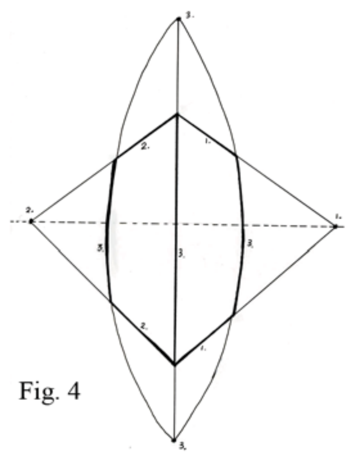


Fig. 4 Four point perspective

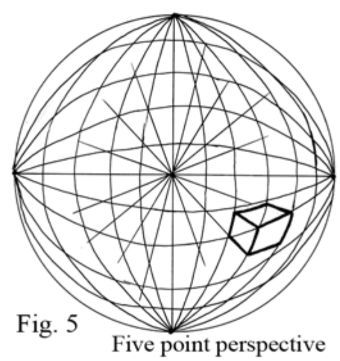


Fig. 5 Five point perspective

Watching the cube go through these changes helped me to guess at each stage what the next step might be. There was a progression to this system. When you think in this way and observe what happened to the cube from one- to two- point perspective and again what happened from two- to three-point perspective, you can pretty well anticipate what happens next.

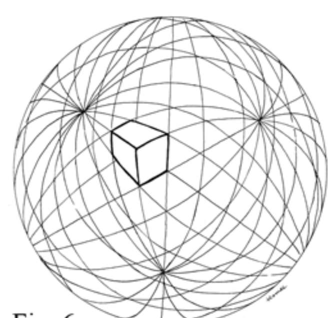
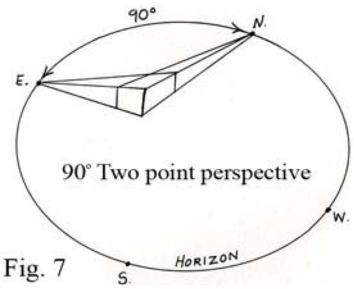


Fig. 6 six point perspective

More Points, More Space

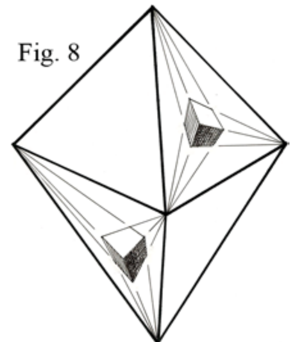
It was seeing these changes in the depiction of the cube that made me aware that there might be more to perspective than what the Renaissance artists/mathematicians found. I noticed that when you move from one- to two- to three-point perspective, you gain more and more of the total view in your picture. Two-point perspective allows only a 90-degree wedge of the

Fig. 7



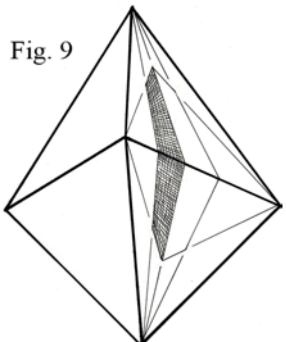
horizon in your drawing *(Figure 7)*. Three-point perspective allows you to depict infinitely far in a third direction—either way up above your head or below your feet—to gather in much more space. It actually gives you one-eighth of the total spherical space around you, one of the triangles of the octahedron *(Figure 8)*. When you add a fourth vanishing point to your drawing, you can see above your head and also below your feet. Four-point perspective gives one fourth of the spherical space around you *(Figure 9)*. Five-point perspective gives you one half of the spherical space around you, or four of the octahedron triangles sphere *(Figure 10)*, but become more curved as they recede from that area. Six-point perspective on the sphere gives you the total 360°picture, with views in all directions *(Figure 11)*. The lines of the cube now are all curved, but in another way they are all straight. If a hundred cubes were drawn on this sphere in six-point perspective, all their edges would lie on great circles, which are geodesics on the spherical surface, hence are "straight lines"; yet in going from pole to opposite pole, they must curve. It gets confusing. If you were inside the sphere viewing the cubes, their edges would all look straight. When viewing the cubes from outside the sphere, their edges look straight near the center of the sphere, but become more curved as they recede from that area.

Fig. 8



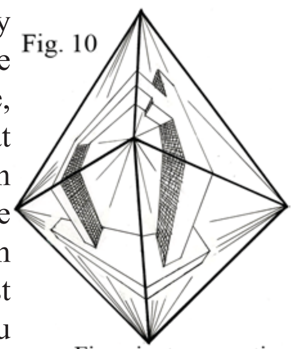
Three piont perspective
1/8 of an octahedron

Fig. 9



Four piont perspective
1/4 of an octahedron

Fig. 10



Five piont perspective
1/2 of an octahedron

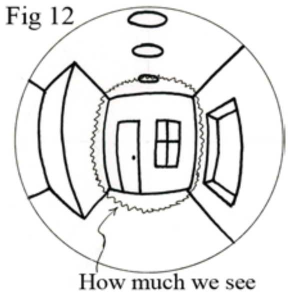
Fig. 11 six piont perspective
1/2 of an octahedron

Distortion

So, is there a lot of distortion to these six-point perspective spherical paintings? I believe the spherical pictures have less distortion than any of those in one- through five-point perspective systems. When you are trying to capture all the visual space around you from one point, I think that you are dealing with a spherical concept. It is like trying to map the spherical Earth onto a flat surface. If you are mapping the city of London you won't get much distortion, but when you are trying to map the total Earth onto a flat surface, there isn't a chance of escaping distortion. Do any of us really know how large Greenland is from the maps we looked at in school? I think not. Spheres don't go flat without distortion. One- through five-point perspective systems are systems which try to make drawings or paintings on a flat plane as real as possible. The fish-eye lens and five-point perspective have a lot in common: nice distortion. If we want to see more and more on a flat surface, the results become more and more distorted.

Now about the sphere. If you think about how much of the total spherical scene we can see clearly without moving our eyes or moving around our head or body, it just isn't very much— maybe 90° *(Figure 12)*. We don't notice much distortion in that small wedge we can take in. If you look at only that much of a Termesphere there also would be very little distortion. The image painted on the sphere's surface continues on and on until it comes back to itself; so does the view of the world around you. There is very little distortion in mapping London and there is very little distortion when you look at a small part of the Termesphere. The reason that it seems like there is a great deal of distortion in the spherical painting is because you get to see so much when you pull back to view the whole scene that is visible—you are taking in the view painted on a hemisphere. All of the lines of a Termesphere are perfectly straight when viewed from the center of the sphere. That might be comparable to the focal area we actually see when looking in our normal world. If you think of it that way, there is very little distortion in a six-point perspective Termesphere.

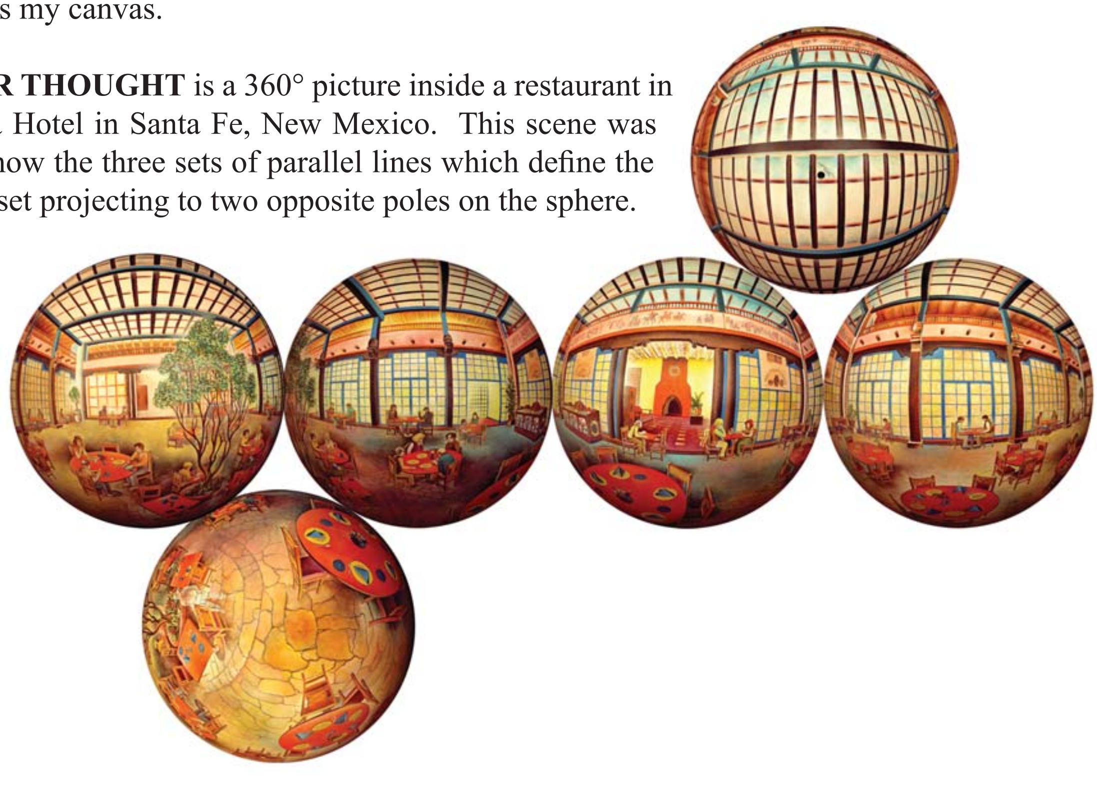
Fig 12



Subject Matter that Comes from Spherical Ideas

To be honest to the sphere as a canvas, the ideas I paint need to be true to the sphere. There are things a sphere can do that the flat surface can't. Those ideas have to do with the wide variety of geometries of the sphere, the endlessness of the spherical surface and how it wraps back upon itself, the three-dimensionality of the sphere, and the fact that one side of the sphere is always hidden from the viewer. If I have an idea could be expressed on a flat surface, then I shouldn't paint it on a sphere. Some of the Termespheres in the figures that follow show how and why I use the sphere as my canvas.

FOOD FOR THOUGHT is a 360° picture inside a restaurant in the Lafonda Hotel in Santa Fe, New Mexico. This scene was perfect to show the three sets of parallel lines which define the room, each set projecting to two opposite poles on the sphere.



GARGOYLES IN ST. DENIS is the interior of a cathedral in northern Paris. This spherical painting shows what you would see in St. Denis if you stood in its center and turned in a circle. This painting takes what you see and wraps it all onto the surface of a sphere.

THE PANTHEON in Rome was designed by the architect to be like a ball with a cylindrical wall around it so when you are standing in the center of the floor under the dome looking up you are conceptually at the south pole of the sphere. I felt this was a very spherical idea.

POINT IN SPACE is a cityscape based on the rhombic dodecahedron. This structure provides six equal spaced vanishing points as well as the edges of the rhombus faces.

LOOKING FOR THE ORDER shows Einstein looking so far that he sees the back of his own head. This was a concept he had to explain: that space is curved rather than straight. Six-point perspective helped to explain this concept very well.

REFLECTING BACK shows two concepts at once: the ball acts like a mirrored ball and reflects back the room containing ball, and the subject is reflecting back in history to find this historical building.

FISH EYE VIEW is a nice example of letting the sphere be a sphere or a fish bowl. Are the fish in the bowl or are they swimming around in the room?

RELIGIOUS SCIENCE is a painting of Stonehenge in England. You are floating above Stonehenge looking down on the total environment of the site. The shadows point the way to the Sun. The Sun and Moon show their geometries: the Sun's geometry grows from straight lines and angles while the Moon's grows out of circular geometry. I do feel the science contributed to the strength of their religion.

WRIGLEY FIELD, Chicago, shows the up, down and all around of Wrigley Field and its Cub's fans

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