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THE CONTENT OF SHADOWING IN PERSPECTIVE IS LIGHT AND THEIR CONDITIONS

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ABSTRACT
In this article, the essence and meaning of making a shadow in perspective depends on the factors of making it and the accuracy of the information about the structure and size of the object. If there was only light and no shadow, or only darkness (darkness) and no light, it would not be possible to see and imagine anything with the naked eye. In fine arts, artists attach great importance to the direction of light and the strength of light. For example, when painting an angry person, if the light is directed from the part below the jaw, the psychological state intended by the work will be effectively revealed. A correctly constructed perspective of an object provides information about its structure. However, in his perspective painting, it has been said that judicious use of light and shadow significantly increases the object's clarity.

Keywords: Light, body surface, Artificial lighting, Natural lighting, Shading.

Introduction

In the space that surrounds us, the light beam spreads along a straight line. The light beam illuminates the side (part) of the object facing it. The unlit part is the private shadow. The boundary of the personal shadow is created by the light beam hitting the object. This border is the line separating the illuminated and non-illuminated (private shadow) parts of the object. The projection of this line on a plane or surface in the direction of light is the cast shadow of the object. Therefore, before determining the cast shadow of an object, it is necessary to make its own shadow. The shadow of an object on its surface is weakened by the rays reflected from the objects around it. Because of this, the object's shadow will be darker than its own shadow. In addition, the light beam is at different angles to the surface of the object. Therefore, parts of the body's surface receive light energy in different amounts. As a result, there is no sharp boundary line between the lighted and shadowed parts of the rotation surfaces. The measured angle between the light beam and the surface normal is the angle formed by the beam with the surface. As mentioned above, a number of physical properties of shadow are widely used by artists (Fig. 1a). In central and parallel projections, shading is done from a purely geometric point of view (except for aerial perspective). The physical properties of the shadow are not taken into account (Figure 1b). Two lighting sources are mainly used to make shadows.

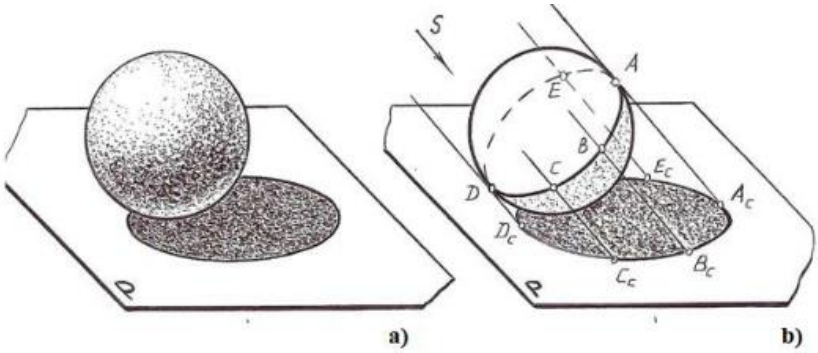


Figure 1.

Artificial (central) lighting source. In artificial lighting, light sources (light bulbs, candles, lanterns, etc.) are located not far from the object, that is, in the three-dimensional space, and they are called point sources. In central lighting, the light beam hits the object and creates a pyramid or cone surface. Central lighting is mainly used to create shadows in the interior. If there are two or more lighting sources, then some of the falling shadows will overlap. Then the overlapping part of two falling shadows is a full shadow, and the part that is not overlapping is a half shadow. By creating a shadow in the interior, room furniture and lighting source locations are checked during the project process and the most optimal option is selected. In order to create a shadow in central lighting, the light source and its projections on the shadowing plane or surfaces must be provided. Figure 2a shows the perspective apparatus and the cross-section AB perpendicular to the object plane and point B lying on it. Rays radiating from an artificial light source C form a shadow ABC at H of the section AB. Since point B lies in the plane of the object, its shadow overlaps with itself. For this, a plane of rays is passed through the section AB, and it intersects with the plane of objects and gives the shadow of the section AB at H. Therefore, the light plane is drawn by connecting the light source S with point A, and its projection on H with point B. Lines SA and S1B intersect to form the shadow AC of point A on the object plane. To perform this process in perspective, perspective images of section AB and SS1 are constructed on the map. Then point S is connected to AK and S1 to BK, and their point of intersection is AKC. The line BKAKC is the shadow of the section AKBK. Figure 2b shows the working situation of the above process, i.e. shadowing the section AB in the picture itself. Here again the lines SA and S1BK intersect to define AKC, AKC is the perspective shadow of the point A, and the line BKAKC is the perspective shadow of the line AB.

S, the surface of the cone and the rectangle (plane) ABCE in the vertical position are given. ABCE is shaded in the same way that we shaded AB in the previous example. The surface of the cone also casts a shadow on the object plane and on the rectangle ABCE. To do this, the shadow TC is determined by combining S1 with the projection T1 of the cone tip T on the object plane, and S with the tip T. An attempt is made from the point TC to the base of the cone and its shadow in H is formed. Lines 1TC and TC2 intersect AE at points 3 and 4, where the shadow of the cone on the ground is refracted. To make the shadow ABCE of the cone in the plane, the shadow T□C of the tip of the cone T in the vertical plane is determined. Points 3 and 4 are joined by T C to form the shadow of the cone on AVCE. The private shadow of the cone is bounded by lines 1T and T2.

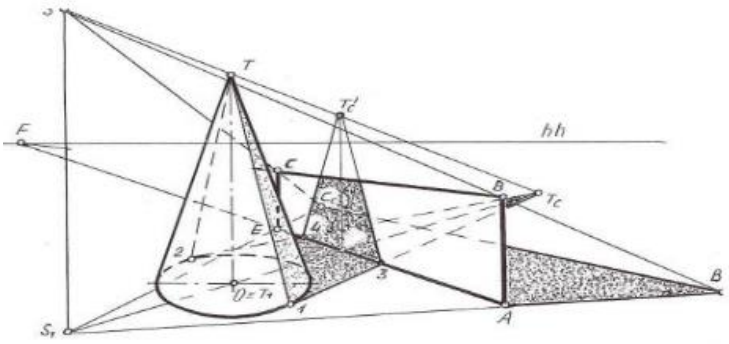
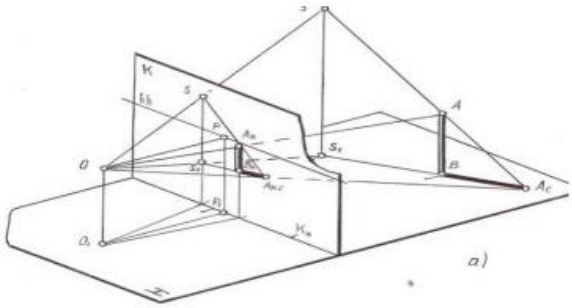


Figure 3

Natural (parallel) lighting source. The Sun and the Moon, which are very far away from us (conditionally infinite distance), are accepted as sources of natural illumination. Light rays radiating from them are considered to be parallel to each other, and such lighting is called parallel lighting. In parallel lighting, light rays hit the surface of the object and form a prism or cylinder surface. Let us take the perspective of the sun as S and the perspective of its base as S1. The sun perspective S is above or below the horizon line and its base perspective S1 is always on the horizon line. Only at sunrise and sunset do S and S1 overlap on the horizon. Figure 4a shows the geometric apparatus of the perspective, the direction of light S and the section AB perpendicular to the plane of the object. In order to make the shadow of point A on



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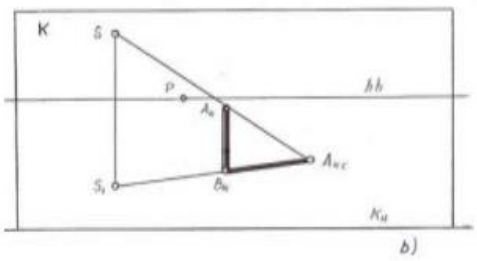

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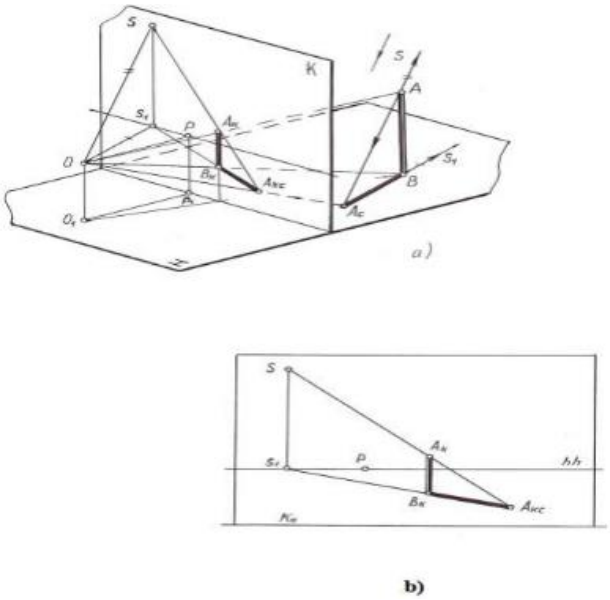
the object plane, a ray plane is passed through the section AB, and its line intersecting with the object plane is made. This line passes through the point B and is directed towards the base S1 of the light source S at H. Here, S1 is the projection of S on H by the direction of the light ray. Now a straight line parallel to the direction of light S is drawn through the point A and its meeting point with the line of intersection of the planes passing through the point B (the plane of the light and the plane of the object) is AC is determined. Point AC is the shadow of point

A on the object plane, and section BAC is the shadow of section AB. To create the perspective of the sun in the picture, parallel straight lines are drawn from the point of view O to the direction of light S and its projection S1 on the object plane. These lines intersect with the picture plane to give points S and S1.



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Point S on the picture is the direction of the light beam, point S1 is the point of its projection on the object plane. Through the point of view O, the perspective of the section AB is made. To make the perspective of the section shadow AKBK, draw straight lines from point S through AK, through point S1 through BK, and find their point of intersection AKC. AKC is the perspective of the shadow of the point A, and the section BKAKC is the perspective of the shadow of the section AB. Figure 4b shows the construction of the cross-section shadow AB in the picture plane itself. Here point S is connected with point AK and point S1 is joined with point BK and their point of intersection AKC is determined. The cross section BKAKC is the shadow of the cross section AKBK. In the design of architectural structures, the rays falling from the natural lighting source (the sun) and the shadows created by them are taken into account. The position of the observer in relation to the sun or the observer of the sun can be different. Below are the characteristics of the sun relative to the observer.

1. The sun is in front (the space of things), on the left.
2. The sun is in front (the space of things), on the right.
3. The sun is located on the right in the back (abstract space).
4. The sun is on the left in the back (abstract space).
5. The sun is on the left, the light beam is parallel to the picture. The direction of light will not have a point of descent.
6. The sun is on the right, the light beam is parallel to the picture.
7. When the sun rises or sets on the right. In this case, of the item
the length of the falling shadow cannot be determined.
8. When the sun rises or sets on the left. Even in this case, the length of the falling shadow of the object cannot be determined. However, if there is a plane or surface behind the object's

shadow, it will be possible to determine its falling shadow. The falling shadow of all straight lines perpendicular to the plane of objects will be directed towards the point of incidence S1 of the perspective of the projection of the direction of the light ray on the plane of objects. The point of incidence of the falling shadow of any horizontal straight line is on the horizon line.

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