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THREE CONSTRUCTIONS USEFUL DURING FREE-HAND DRAWING OF GEOMETRICAL FORMS BASED OF THE THALES' THEOREM AND TRIANGLE SIMILARITY PROPERTIES

Free-hand drawing has always played an important role in the education of architecture students. Since the beginning of architecture and town planning studies at the Technical University of Lodz in 1974, drawing has been strictly defined. It has been supposed to teach to integrate science, and art or in other words knowledge and intuition in a material form of drawing. As for science, information about perspective, geometrical built of a model and drawing and painting technology ought to be mentioned. Intuition is irreplaceable in creative search for the ways to achieve compositional balance or in creative interpretation of the model's material by means of different drawing textures. The range of integration of those two characteristics is definitely limited in free-hand drawing. It is, however, extremely important for this process to take place since the beginning of education even though lack of knowledge and experience make it impossible to succeed in this field during designing. It is a tradition of our department to care about maintaining the right proportions between those two elements in such a way that neither of them dominates the other one but they complement each other. This paper, based on a few examples of exercises done during free-hand drawing classes, shows the geometrical constructions helping to solve typical problems with perspective that occur during work with assigned tasks from still life or topics from imagination.

The characteristic of free-hand drawing is also the fact that it makes use of knowledge about projection in a free way. A frequent phenomenon is introducing a few main points of image plane into one drawing as well as drawing one object of the composition in central projection onto vertical image plane and another one onto leaning image plane. Some doubts concerning the use of geometrical projection in painting were raised by prof. Bartel in 1928 when he observed that his “Painting perspective” should be enriched with works concerning physiology and psychology of seeing.

The first construction shows the first problem that the students face: they have to draw a still life object which has many lines that we know are parallel. In the drawing, however, there are not any vanishing points and it is not possible to make use of the horizon which, for compositional reason, is located out of the drawing. Anyway, thanks to observation, we can place at least two from many lines parallel to a given direction into a drawing.

Fig.1 Construction allowing achieving several lines convergent to one vanishing point on the basis of two lines measured from the model.

The second construction deals with the problem of drawing a cylinder and its derivatives. How can we configure the proportions of upper and lower ellipse properly, if we can place the horizon in the picture and we assume that we know the location and proportions of one of them? How to find additional ellipses if cylinder cross-section with their planes parallel to the base? Answers to those questions can be found in simple theorem in form of a formula placed over Figure nr 2.

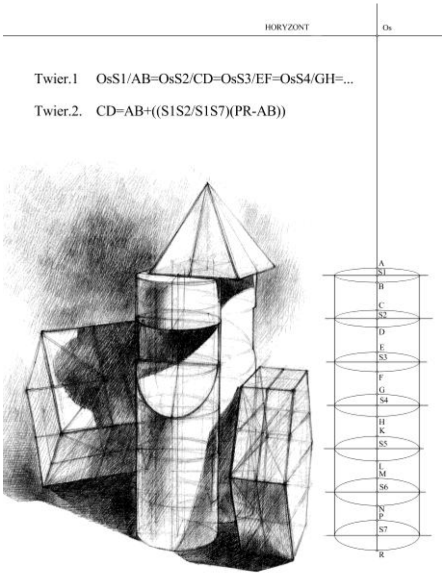

Fig.2 Theorems regarding ellipses' proportion in a perspective drawing of a cylinder.

The third construction (Fig.3) suggests building the perspective in case of the "bird's eye" view. In this situation there is no room for the horizon in the drawing and we would like a straight lines beam that builds the base mesh to cross it properly.

Twier. 3 AB/CD=A'B'/C'D'

E'F'/C'D'=E''F''/C''D''

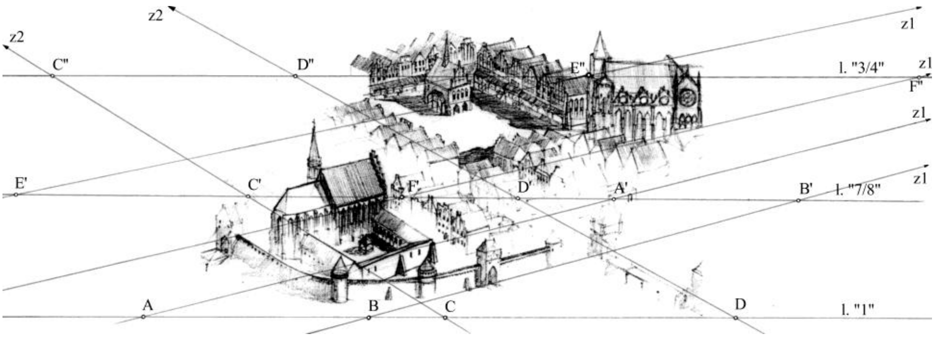

Fig.3. Using horizontal convergent "rulers" while constructing a Bird's eye view.