On the Subject of Cutting a Regular Hexahedron in the Class of Descriptive Geometry (3)

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Abstract

The aims of this essay are that: i) to introduce the subject of cutting a regular hexahedron in the class of "Descriptive Geometry" for the students of Department of design. ii) to think of the meanings of this subject.

The contents of this subject are the practice of basic drawing of figures and training of imaging forms. And the regular hexahedron has a relation with creation because of the many existences of artworks and design products.

As a result, this subject has the meanings for bringing up the cognition and knowledge about the plane figure in space.

1. Introduction

This subject of cutting regular hexahedron is the one of Descriptive Geometry for the freshmen of Department of design in Faculty of Fine Art (Fig.1).

I made the subject by the way of thinking true-size shape of section of space figure as plane figure.

This essay are to introduce the contents and think of meaning of the subject.

2. On the drawing(s) of the subject of cutting a regular hexahedron

I show the process of the drawing(s).

2.1. Rotating regular hexahedron viewing top to the angles freely. Deciding the positions and angles of line(s) of cutting plane (Fig.2).

2.2. Making two developments of four lateral faces and base from Fig.2 (Fig.3).

2.3. Deciding e_0, f_0, g_0, h_0, i_0 are decided from horizontal projection plane, and e'_0, f'_0, g'_0, h'_0, i'_0 are decided from vertical projection plane (Fig.4).

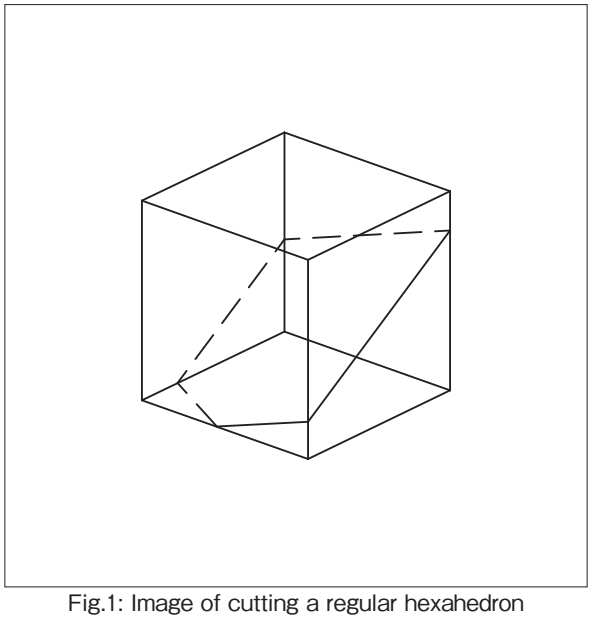

Fig.1: Image of cutting a regular hexahedron

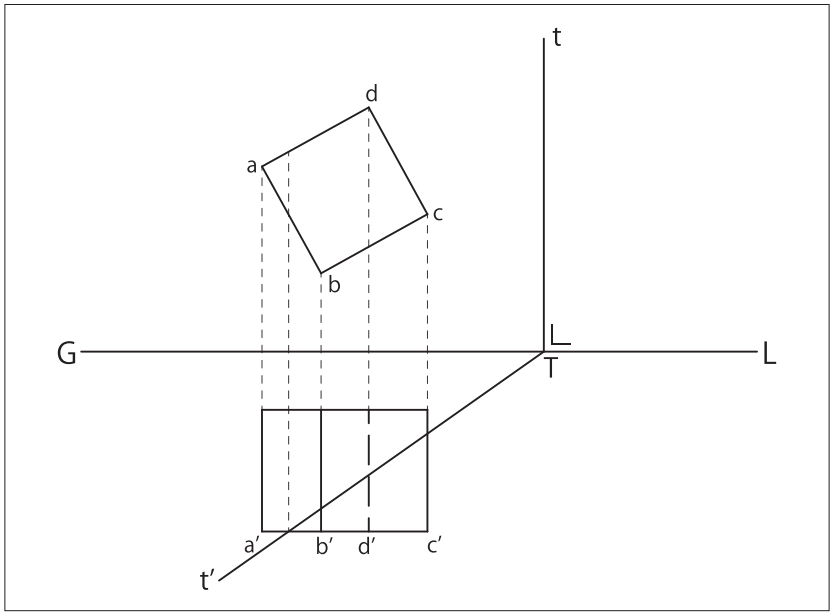

Fig.2: Regular hexahedron and cutting plane

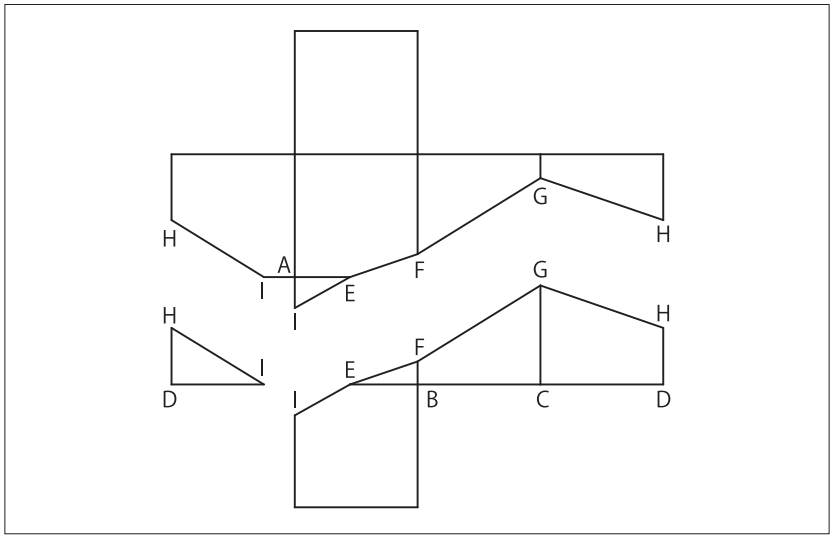

Fig.3: Developments of lateral faces and base

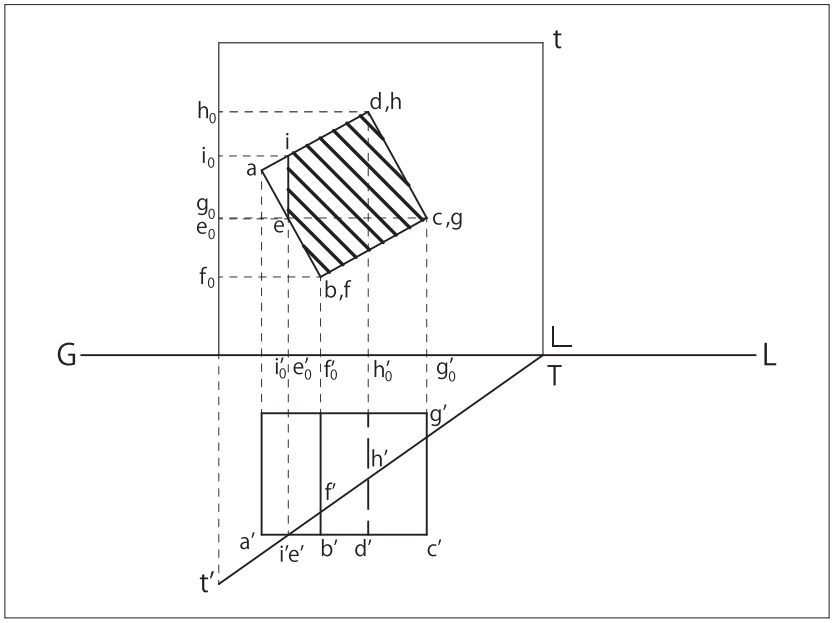

Fig.4: Cutting plane and section

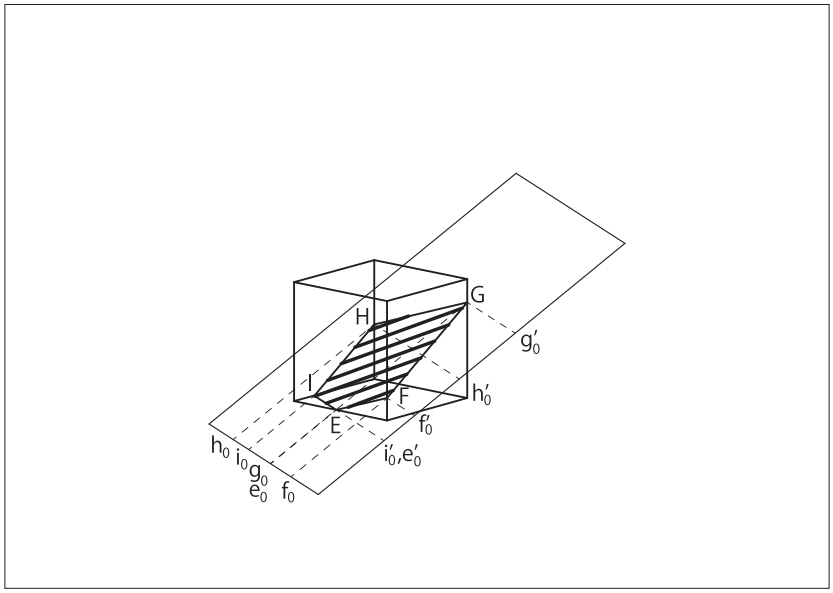

Fig.5: Image of cutting plane and section

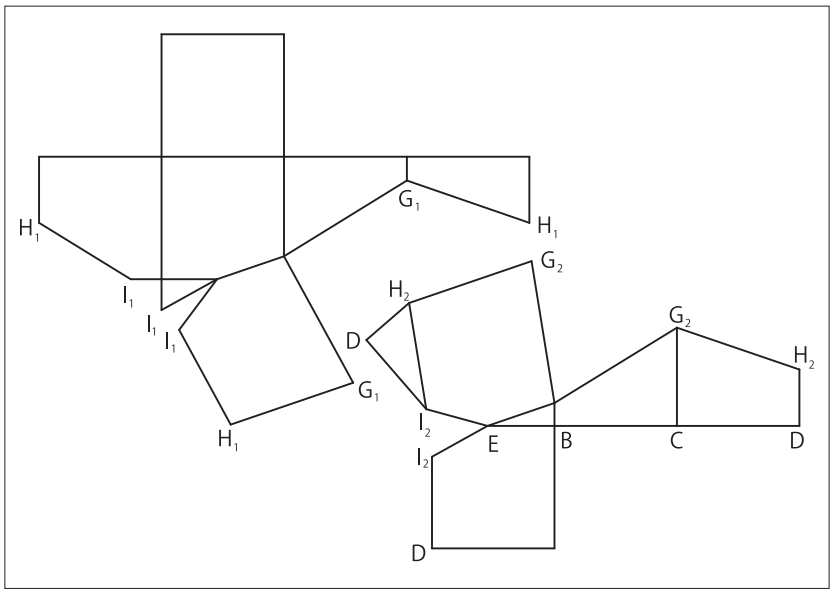

Fig.6: Developments

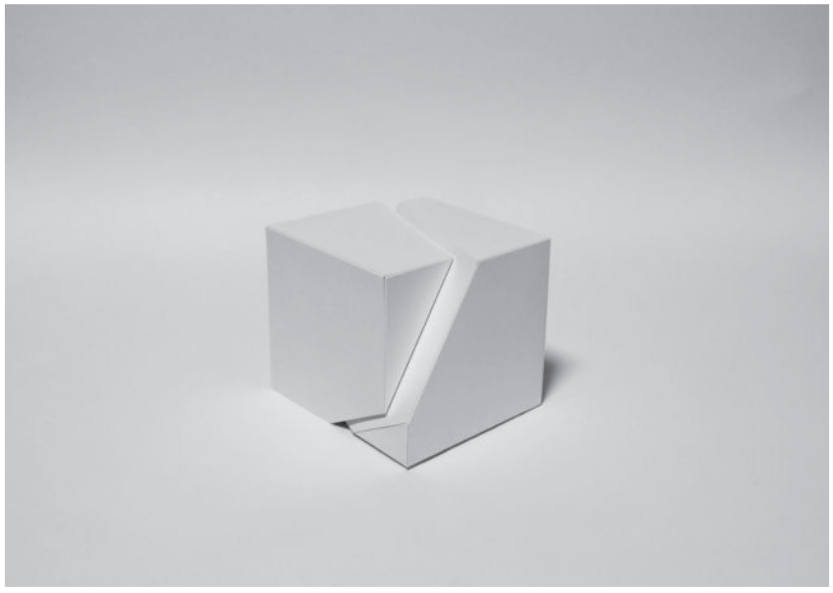

Fig.7: Paper model

2.4. True-size shape of section is on cutting plane. True-size shape of section is made from e_0, f_0, g_0, h_0, i_0 and e'_0, f'_0, g'_0, h'_0, i'_0 (Fig.5).

2.5. Making completed two developments from Fig.4, Fig.5 (Fig.6).

2.6. Making paper model from Fig.6 (Fig.7).

3. The meaning the subject of cutting a regular hexahedron

Regular hexahedron is form which is easy to recognize. And the subject of cutting regular hexahedron is suitable for the freshmen of Department of design as a training of understanding forms with image.

The feature of this subject is to think of true-size shape of section of space figure as plane figure and draw it. I drew the true-size shape of section using the fact which true-size shape of section in the cutting plane. I showed the above content in Sec. 2 and it is a basic training for accurate expression of shape.

And this subject is related to creations because many forms based on regular hexahedron exist in artistic works and design products. Then we can expect that each student will bring up the cognition and knowledge about the plane figure in space with this subject.

4. Conclusion

Regular hexahedron is form which is easy to recognize. This subject of cutting regular hexahedron is suitable for the freshmen of Department of design as a subject of basic expression of shapes with simple drawing figures.

The feature of this subject is to draw it using the fact which true-size shape of section is on the cutting plane.

This subject has the meanings for bringing up the cognition and knowledge about the plane figure in space.

図学における正六面体を切断する課題について(3)

松　岡　龍　介

要　約

本稿は，デザイン学科の学生を対象とした「図学」の授業における正六面体を切断する課題を紹介することと，この課題の意義について考察することを目的としている。

この課題の内容は，基本的な作図の練習と，形態をイメージするトレーニングである。また，正六面体は，芸術作品やデザイン製品に非常の多く存在していることから創作との関連があると言える。

結果として，この課題は，空間における平面図形の認識と知識をより深めることに意義があると考えられる。