SYSTEM OF PROPORTIONS

SYNOPSIS

This thesis deals with system of proportions. Here systems of mathematical relationships that are found in architecture are termed as systems or theory of proportion. Considering the imperfections of the present-day proportional system developed by Le Corbusier - called the Modulor - a study is made here of those proportions of the human body which determine the occupation of space by the body, in order to establish a system of proportions if there is any. It appears that there is a definite ratio between the various parts of the body that determine the occupation of space in architecture and further define the bodily proportions. These proportions give rise to a definite geometric series and further correspond to various elements in architecture. 0n investigation it appears that there exist the same mathematical relationships in conventional dimensions of existing and proposed house plans. It appears that this system of proportion is based on more rational and functional basis than the 'Modulor' and can be applied to the present-day architecture in order to achieve economical, functional and aesthetical results. The thesis is devided into four chapters.

A brief review of previous works directly related to the present work is reported in Chapter I.

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In Chapter II a study of the proportions of a human body is made considering only those physiological points which determine the space occupied by the body, and define also its proportions. Here these points are considered as characteristic points of the body. The proportions of the body are determined in terms of the distances of these points from the origin. (In the horizontal plane, the floor is considered as the origin. While in the vertical plane, the tip of the middle finger of the stretched arm is considered as the origin). Actual measurements were taken of these human proportions, and it is found that there exists a definite geometric series in which the numbers increase by a common ratio 1.666 in these proportions. It is interesting to notice that the same series is derived out of the same proportions of the body, even if the origin is shifted to the tip of the middle finger of the uprised arm and measured towards the floor for the vertical dimensions. Similarly, the series remains the same even after changing the direction in the case of dimensions in the vertical plane.

It appears that there exists a 'perfect symmetry' in the proportions of the body, and that the series with a common ratio of 1.666 is derived in all the four directions of both horizontal and vertical planes.

In Part Two of this Chapter the study is compared to The Modulor. It appears that the system of proportions

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developed here is based upon more rational and functional basis than the Modulor.

Chapter III

Here the conventional dimensions of residential buildings are investigated. Vertical and horizontal dimensions have been studied in houses taken at random from various types of houses in India. Dimensions recommended in various house standards are also included. The vertical dimensions of common vertical elements are found to bear a ratio of 1.6 to one another. In other words, there exists a definite mathematical series with a common ratio of 1.6 in these vertical dimensions. Similarly, it is observed, that there exist the same mathematical relationships in the horizontal dimensions of the common space elements.

Chapter IV

The aim of this Chapter is to investigate the possibilities of application of the system of proportions developed here in the present-day architecture. It appears that with the application of the system we get functional, economical and aesthetically beautiful results in architecture.

> Note: References are given at the end of each Chapter.