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TROPICAL BUILDING DESIGN AND CONSTRUCTION

THE design and construction of buildings in the tropics raises many problems in view of the variety of climates that obtains in the region and the conditions of living which are economically backward. These were considered by a large group of experts at a symposium* held in Delhi, with a view to assess the part which science can play in their solution.

Discussing the general principles of building design in the tropics, it was pointed out that each climatic sector called for individual interpretation and treatment by the designer These sectors are marked off from one another by variations in climatic factors such as direction and intensity of wind, temperature range and relative humidity, distribution of rainfall and duration and intensity of solar radiation. But it would appear that in many constructions in this region, these climatic factors have not been suitably taken into account. The symposium, therefore, recommended that a wider use be made of tabular climatic data and charts as are already available in each iso-climatic sector and that steps should be taken to supply the deficiency in the other sectors also.

The physical features of the site, such as slope, tree cover, etc., play an important part in the layout of a building. Thus, advantage can be taken of natural slopes to provide for easy drainage and sewage disposal. It was pointed out similarly that dwelling consisted not only of the space within the plinth area, but included also part of its immediate surroundings. Thus, trees appropriately sited near the house, provided outdoor living space below them, for the family and for guests; also such trees could afford, if suitably situated, protection against direct sun rays, wind and rain to the inmates, and protection also to the building itself. The symposium in this connection also recommended that there should be provision of space for vocational work and shelter for domestic animals, and that a survey should be made of traditional building methods and local forms of house design and construction in the

* Report of the Regional Symposium held on the subject in Delhi during December 1952.

different parts of the region, showing in particular, their relationship to climate and indigenous materials.

In regard to building materials it was felt that until the availability of cement increases, concrete would find its application mainly in cities where there was a paucity of other suitable building materials, and also for large public constructions in areas within easy reach of cement factories or a sea port. Several papers in the symposium were directed to a discussion of the properties and uses of light-weight concretes, using locally available aggregates; special attention being given to vermiculite, since sizable deposits of it were available in Mysore and West Bengal. Other important light-weight aggregates referred to, were volcanic ashes, obsidian, rice husks, wood wool, bagasse and other vegetable fibres. There seemed, however, to have been little scientific research on the use and development of these light-weight concrete materials. Reference was also made to aerated concrete and particularly, to the use of *ritha* (the fruit of a tree resembling the tamarind and containing 25 per cent. saponin) as a foaming agent; however, there did not seem to be any long-range experience in the use of this reagent.

In this connection, the following are some of the recommendations of the symposium: (1) further research into the long-term behaviour of light-weight concretes, especially those made from organic aggregate materials, should be undertaken; (2) facilities for the study of better brick-making processes should be provided; (3) improved uses in building of earth, particularly in a stabilised form, should receive wider publicity, since this material has good potentialities in many areas, and that building material testing laboratories, distributed throughout the area, be made responsible for the testing and control of improved earth building; (4) the use of laminate and treated timber should be encouraged immediately; and (5) composite bamboo-concrete construction is to be investigated thoroughly by a recognised authority.

With reference to construction practice and vocational training, it was felt that University courses in Engineering and Architecture may advantageously include adequate training in the technique of job organization and labour management at site level. Also, adequate vocational training schemes should be provided for workers in the building industry, and provision made to keep them abreast of the latest developments in their particular fields. Especially, long-term building programmes should be designed wherever possible, so as to ensure that workers may become proficient at their job and also with a view to reduce fluctuations in the use of plants and labour man-power.

A number of papers were presented at the section relating to provisions for comfort, sanitation and public health. As a result of the discussion, the symposium recommended that investigations be made in different climates of the region to determine the thermal insulating behaviour of different wall and roofing constructions so as to provide more comfortable conditions indoors during extreme changes of weather. It was also suggested that a special symposium should be organised to deal with the problems of sanitation, water-supply and other health aspects of housing.

A special section was devoted to a consideration of the organisation of research, testing procedures, the maximisation of the results of research through standardization and the use of building information services. A very useful report by ILO surveyed building research and experimentation already carried out in the Asian region. At length, the symposium resolved that national bodies, similar to the Indian Standards Institution, be set up elsewhere in the region and that consideration be given to the possibilities of Shape Engineering in effecting substantial economies in both steel and reinforced concrete structures, with due regard to factors of corrosion, fire resistance, manufacturing limitations and structural stability. Having noted with satisfaction the establishment of the INSDOC, it was suggested that in order to ensure adequate provision, exchange and dissemination of scientific and technical knowledge on all aspects of building design and construction, steps may be taken to set up a more specialised Building Information Service at an early date.

KALINGA AWARD FOR 1953

THE Kalinga Award for distinguished popular writing in science was made this year to Dr Julian Huxley, at a ceremony in Paris on July 2 Dr. Huxley, who was UNESCO's first Director-General, had been nominated for the prize by both the Royal Society of Great Britain and the Institute de France. The first award, in 1952, went to the French scientist, Prince Louis de Broglie.