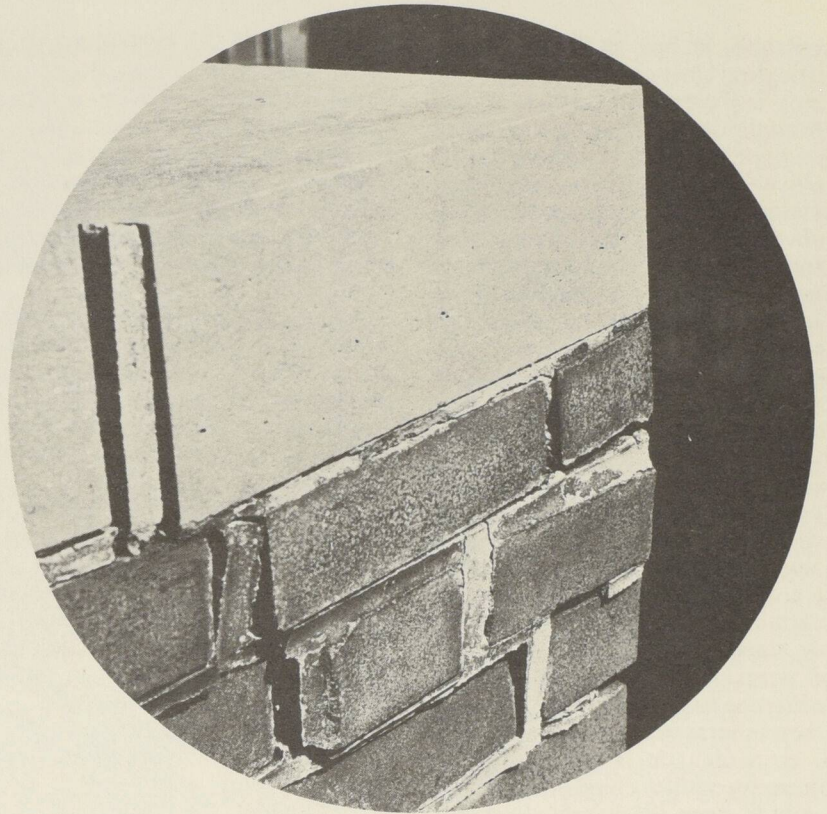


# unique research laboratory



*Weather-beaten masonry at building parapet. The culprit is moisture-laden air from inside buildings which leaks through the construction. In cold weather, the vapor condenses and freezes causing this type of masonry damage.*

*La maçonnerie dégradée par les intempéries. Le coupable, c'est en réalité l'air chaud et plein d'humidité qui s'échappe vers l'extérieur du bâtiment à cause de la construction défectueuse. Pendant l'hiver, la vapeur d'eau condense puis gèle, et les forces d'expansion font le reste.*

## A unique facility which will be used to study a host of building problems including those posed by high-rise buildings

High-rise buildings, by their very style of construction and the harsh climatic extremities that dominate their environment, pose a host of problems often unnoticed by architects, builders and even owners. Many of these problems stem from the characteristics of air, heat and moisture flow peculiar to high-rise buildings.

The cause of a variety of serious difficulties is the "chimney effect" created by warm air rising within the building and escaping through cracks and openings in the upper part of the building,

and cold outside air flowing in at the bottom. The difference in air pressure inside and outside the buildings causes air to surge upward despite the barriers imposed by interior walls and floors. With that air goes the water vapor introduced by humidifying systems. The relatively high pressures built up by the "chimney effect" forces the humidified air into the exterior walls of the high buildings. High up, walls become saturated, resulting in damage to the structure. Excess water may flow downward, causing problems at lower levels. Principles are known but information is scarce as to how to translate them into real design.

A new test facility is being built in Ottawa to study the "chimney effect" and other building problems. These include damage to outer walls caused by severe condensation and then repeated freezing at upper levels, the dangers of asphyxiation from smoke swirling up

through a building during a fire and the difficulties in providing even humidity, heat and ventilation throughout a high-rise building.

Designed for the testing of full-scale building components at temperatures ranging from minus 65 degrees Fahrenheit to 150 degrees above zero, the facility will form part of a new Environmental Laboratory for the Division of Building Research of the National Research Council of Canada. The laboratory, in the planning stage for several years, will be located in Ottawa at the Montreal Road site of NRC and it will form part of the Council's Building Research Centre. A \$2,033,000 contract for construction of the laboratory has been awarded to P. E. Brule Construction Company of Ottawa.

The primary function of the laboratory will be to provide for research into the effects of environment on building structures and means of controlling