all construction trades are in the same boat with bricklayers when it comes to seasonal employment.

Another major problem facing our industry is a shortage of skilled craftsmen. Today we are finding it more difficult to attract young men to our trade—and holding them once they enter into training. Many young boys start out as bricklayer apprentices and then drop out to enter into occupations where weather is not a factor and fuller employment is assured them.

If "seasonality" could be eliminated a substantial reservoir of skilled craftsmen would be added to our national work force virtually overnight. Our trades would then attract the additional manpower needed for continuing survival of our industry.

The solution to the problem, unlike many of today's solutions, does not depend on untried technology. Instead, it depends on the application of several tried and true principles which make it entirely possible to continue construction work in all kinds of weather. "All-weather" construction is not theory: It has been proved over and over again. In the United States, there have been enough separate cases in which it was successfully tried for us to consider the present technology as adequate. Indeed, the planning and the tools that are necessary for "all-weather" construction are well known to many general contractors, mason contractors, other specialty contractors, and to architects and engineers as well.

The Mason Contractors Association of America has held many seminars for its members on this subject. The Associated General Contractors of America has promoted the technology of all-weather construction to its members. Technical magazines that are widely read by contractors, architects, and engineers, have called attention to the "ways and means" of construction under adverse weather conditions.

The two technical keys to all-weather construction are cheap, easy enclosure, and mechanical heating or cooling. A variety of enclosure materials and methods have been used with success. Most often the material is lightweight, transparent plastic which frequently can be re-used. Heating or cooling can be provided by gas, oil or electric space air conditioners that are readily available.

Some contractors have built even very large buildings in winter by enclosing the entire structure. At Brampton, Ontario, Canada, a 22,000 square foot, single-story structure was built this way in eight weeks. In Winnipeg, Canada, another contractor completely enclosed a six-story building with polyethylene and wood-fiber board. At Calgary, Canada, a builder used bowstring timber trusses to support a plastic roof over a 10-story structure. (The contractor estimated the actual cost of this kind of shelter at 10 cents per square foot—against which should be offset increases in productivity due to comfortable working conditions and the economic advantages of early completion.)

But where it is not possible to enclose an entire structure, other techniques have worked well. An eight-story building was constructed in Winnipeg in the winter after the contractor developed an enclosed swing scaffold which was hung on cables from roof outriggers. The platform was enclosed with plastic and heated, so that masonry work and glazing could continue throughout the winter.

Construction of the Fine Arts Building at Northern Michigan University was a good example of the practicality of all-weather construction. The contractor erected scaffolding and placed a plastic covering over it in two weeks. Steam heaters were used to heat the three-story building to 50 degrees F., even when outside temperatures were 35 degrees below zero. The contractor estimated that his heating costs were $30 a day.

It is no longer necessary to prove the point that if construction work is properly planned and scheduled, it is a relatively simple matter to use one of several available materials to enclose all or part of the structure, use available space heaters to warm the enclosed space and thus continue to work in cold and/or wet weather. Neither is it necessary to prove that the ingredients used in brick and concrete work can be handled satisfactorily in cold weather. We have, in fact, advanced to the point where serious consideration is being giving to enclosing and cooling construction sites in hot weather, thus increasing productivity and reducing on-site mishaps.

The evident reluctance of the construction industry to go all-out for all-weather construction must, therefore, be ascribed to some factor other than practicality—perhaps a belief that all-weather construction is costly, or that it lowers quality, or that it is not worth the trouble. The broad experience of Canada should dispel any such beliefs.