

CHEAPER HOUSES THAT LAST LONGER

Written for "The Listener"
by R. AMMER

THERE is an old saying that "a fool can learn from his own experience, but that a wise man learns from the experience of others." This proverb may be qualified by circumstances in which the wise man must gain his knowledge by his own experience in the absence of other pioneers, whether fools or not, but it may be said that we, as a nation, have acted like fools with regard to building. We have had the experience of hundreds of generations, in all parts of the world, from which to draw our knowledge of materials and methods, yet still continue using temporary materials, even for buildings intended to be used for generations to come. The use of wood, except where a satisfactory substitute cannot be found, should cease as soon as possible (which could be within two years if we have the determination to do it), and fire, rot, and borer-proof materials should be used for all buildings to be used for over 10 years. The cost need not necessarily rise, in fact, it may be reduced.

Back to Earth

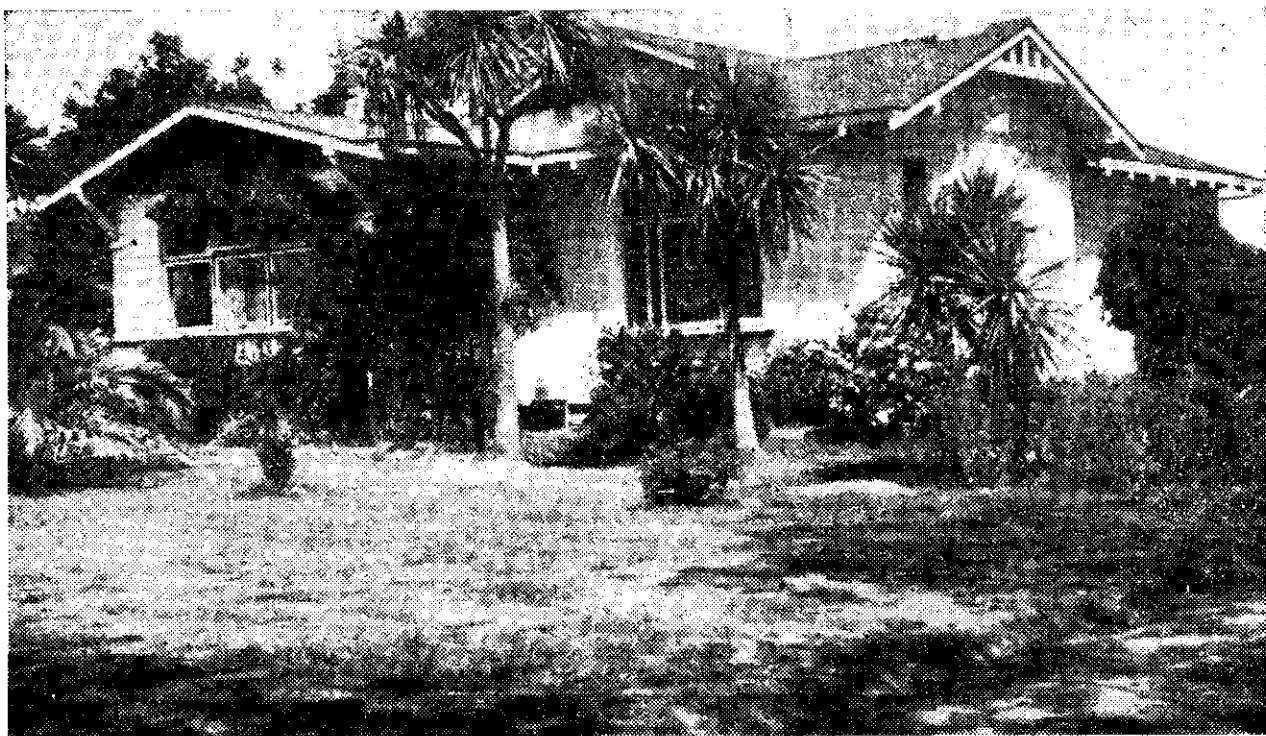
The material that could reverse the present policy of waste to one of thrift is, perhaps, the most ancient, for building purposes, known to man. It is *earth*!

Used with intelligence, and according to correct engineering principles, there is no better substance, and it may become, under mechanisation, the most reliable of all known building materials. By reliable, I do not mean strongest, but a substance that can be calculated to carry a load without having to use a large safety-factor to take care of the uncertainty that is inherent in all building materials. The variation in the quality of bricks, for example, is very great, and the same may be said of wood and concrete.

In rammed earth building, properly mechanised, the quality of every cubic inch could be made uniform, and therefore the whole structure could be calculated very closely, the only safety-factors being those for emergency stresses as in a hurricane, or earthquake, which have to be considered whatever material is used.

Of course there is a lot of prejudice to be overcome before *pisé* (a better term than rammed earth) comes into its proper place in housing the people, and the various articles appearing in the daily papers do nothing to remove the doubts. Indeed they seem to tend more to confusion in the public mind as to what is a rammed earth, or *pisé-de terre*, house. Therefore I write this in the hope that this confusion may be cleared up, and that a better knowledge of this most ancient method of construction will lead to its greater use in housing, if not in industrial and public buildings.

To say a house is of earth is not sufficient, because the method of use makes a vast difference in both quality and appearance, as well as in the cost, although the material used may be similar in each case.



EARTH HOUSE: This attractive home has chimneys and walls of adobe, the walls at the rear of the chimneys being of *pisé* construction. The large photograph was taken last year, the smaller one, at right, shortly after the house was built in the early '20's

The crudest types of earth houses are "wattle and daub," and "sod." The former is a structure of branches and twigs interwoven; the interstices being filled and surfaces brought to near plane with a mixture of mud and straw, or other fibrous substance. The latter, as the name suggests, is built of sods cut from the soil, and laid like very rough brickwork to form the walls, which in some cases, are brought to a more or less smooth surface with mud, or a mixture of cowdung and mud. The more commonly used kinds of earth building are: (1) Adobe; (2) mud or cob; (3) *pisé*, or rammed earth. Adobe is a Spanish-American term for sundried brick. This is much used in Mexico, and has been in use in Asiatic countries for thousands of years. In Babylonian times they used sundried brick for office stationery as well. Of course penny postage was not then thought of. I have employed adobe in building many years ago to enable me to compare its qualities and cost with those of cob and *pisé*.

Cob (mud) walls are constructed by at least two methods. The oldest method is to pug the mud by tramping, while adding straw, or other fibrous material. This mud is then lifted by a fork and placed on the wall, and consolidated by the use of a spade, or other suitable implement. When a course is laid right round the building, and has become sufficiently set, the mud is trimmed with a sharp spade to the correct line, and the process is repeated till the desired height is reached.

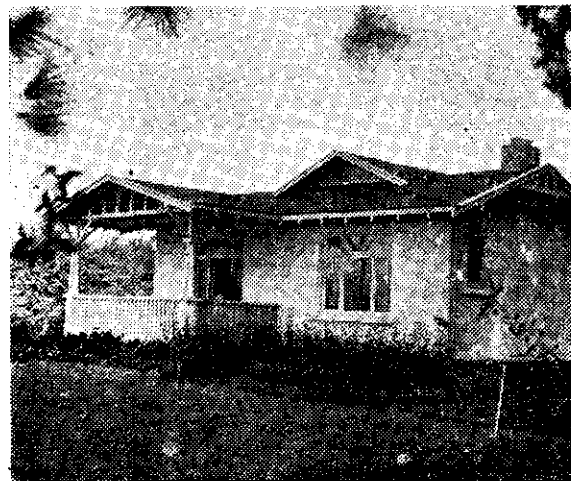
A less laborious method is that in which the mud is placed in forms, or shutters, as for concrete, and tramped, or rammed to consolidate it. Some workers omit the fibrous material while pugging and introduce it in frequent layers during the ramming process. The fibrous

stuff serves the double purpose, in either case, of preventing the "pug" spreading too much while wet and distributing the shrinkage over the whole wall. If no "binding" is used, one might get a two-inch wide vertical crack in a wall 10 feet long, when the mud is dry, whereas the binding divides the shrinkage into millions of very small cracks distributed over the whole wall.

Pisé is the product of thorough ramming of screened earth as it is dug from the ground, without adding water (unless the earth is too dry). Heavy moulds are used, and the ramming is continued until the earth has a close, almost rocklike, texture. No "binding" is used because there is practically no shrinkage to combat, and its use would tend to weaken the wall.

No Plastering

Both adobe, and cob, require plastering of some kind to make a decent finish, but *pisé* does not. While weeks, or even months, of drying out are required before a cob house is "livable," *pisé* houses may be occupied comfortably as soon as the roof is on and the plumbing done. The material and labour used in the three kinds of earth house do not differ much, but it is the after treatment to achieve a good finish and great strength that makes *pisé* stand out by comparison as the best of all. A statement by the Housing Department that if *pisé* construction had been used by them their output would have been reduced by 75 per cent. implies that the *pisé* house costs so much more than the average of the brick, concrete, and wood



frame houses that are being built. The Department has been either misreported by the Press, or misinformed with regard to the possibilities of *pisé*.

I admit that in the old method, all manual labour, the man-hour content of earth walls was great, but in *pisé* this is balanced by the fact that, if the correct technique is used, there are savings in all these ways: Timber, or other wall material, and cartage; plaster; labour; reduced repairs and painting costs; reduced insurance charges; reduced heating costs; no borer to combat.

All things considered, and taking a long-term view, a *pisé* house is a very economical one. While a *pisé* building is permanent, and will last for centuries, it is warmer and drier than others in winter and cooler in summer. The walls do not "sweat," and one does not have to hear the weird output of sleeping neighbours.

Vested Interests

The fact that *pisé* is so economical is of course one of the reasons why it is not boosted by the building trades and other interests. The timber men see in its use a reduction in sawmill

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